DOCUMENT RESUME

ED 039 884 08 JC 700 167

AUTHOR	Feirer, John L.; Lindbeck, John R.
TITLE	Development of Junior/Community College Curricula for Future Teachers of Industrial Education. Interim Report.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO	BR 7-0074
PUB DATE	Jun 70
GRANT	OEG-0-8-070074-3713 (085)
NOTE	580p.
EDRS PRICE	EDRS Price MF-$2.25 HC-$29.10
DESCRIPTORS	*Curriculum Development, Curriculum Planning, *Industrial Arts Teachers, *Junior Colleges, Preservice Education, Teacher Education, Teacher Education Curriculum, *Teaching Programs, *Technical Education, Transfer Programs, Vocational Education Teachers

ABSTRACT

The current and projected shortage of qualified industrial education teachers threatens the continued growth of technical programs in the community junior colleges. As a result, this study of current teacher preparation programs in six states was begun. An analysis of catalogs of all public junior and senior colleges in California, Florida, Illinois, Michigan, New York, and Texas reveals the kind of courses currently offered that might be useful in such preparation. A survey of current research and of the responses to questionnaires by administrators, counselors, department heads, and transfer students reveals the interface between junior college programs and those at the senior institutions. Finally, a Work-Study Conference of individuals with experience in this field developed a Guideline Bulletin (see appendix) that discusses the teacher shortage problem, facilitation of transfer, current and future institutional requirements, and problems faced by the transfer student. Concurrently developed are two teacher preparation programs that emphasize the interface between the junior college and the senior institution: (1) the Partnership Program, designed for students who have already decided to become industrial education teachers even before entering the junior college; and, (2) the Pyramid Program, designed for those who decide to teach while in junior college or before entering a transfer institution. A comprehensive bibliography is included. (JO)

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ED0 39884

Interim Report

Project #7-0074
Grant #OEG-0-8-070074-3713 (085)

DEVELOPMENT OF JUNIOR/COMMUNITY COLLEGE CURRICULA FOR FUTURE TEACHERS OF INDUSTRIAL EDUCATION

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June 1970

The research reported herein was performed pursuant to a grant with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

JC 700 167

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SECTION ONE
INTRODUCTION

The Community-Junior College and Industrial Education Teacher Preparation

The greatest single influence on the programs of teacher preparation in industrial education in the years ahead is the present-day, fantastic growth in technical programs in the community-junior colleges throughout the country. No one can possibly predict exactly how this growth will change the quality and quantity of teachers produced. However, the effects of this growth cannot be ignored by those responsible for planning future programs of industrial teacher education. If there are to be good programs in industrial arts, vocational-industrial, and technical education; there must also be qualified teachers.

In past years, these teachers have come from two primary sources. One source was undergraduate programs of industrial teacher education in which students began as freshmen and completed a four-year bachelor's degree program to prepare for teaching industrial arts in junior or senior high school. The second was the selection of qualified craftsmen to become vocational-industrial and/or technical teachers. These craftsmen were given certain professional courses in educational technology with a view toward making them adequate and qualified teachers of trade subjects.

Today, a new element has been added that will revolutionize teacher preparation programs; this element, of course, is the fantastic growth of our community-junior colleges. With this growth must come changes in programs in the senior institutions. More and more freshmen and sophomore students will enter community-junior colleges to prepare for the world of work. Most of those students who enter technical programs will have a two-year associate degree as their original objective. However, as students are successful in both academic and technical courses, they will become more aware of career opportunities that require a four-year degree program. It will be from this source that the great majority of industrial arts, vocational-industrial and technical teachers will come.

Because of this change in the first two years of college preparation, the senior institutions must adjust to a new teacher preparation program and a new source of teachers. More and more of the senior institutions will become mainly upper undergraduate and graduate schools. In certain states, particularly Florida, the new universities are upper undergraduate institutions only with the base preparation given in the community-junior colleges. All students, therefore, are transfer students.

How will this affect the kind and number of industrial teachers prepared? These are questions for which there are no easy answers. However, guidelines must be established if there is to be an orderly and realistic transition from the old to the new ways of preparing industrial arts, vocational-industrial, and technical teachers. It is with these problems that this study is concerned.

No one can predict precisely what changes are needed and how they should come about. However, until there is an organized and orderly approach, solutions will be fragmented and will be based, all to often, on the individual judgments of department heads or deans of admission in senior institutions.

Since adequate teacher preparation is the most critical problem in the future of industrial education, there must be serious thought given to the guidelines needed for cooperative action between community-junior colleges and senior institutions. This is not a one-sided problem. It cannot be dictated by the requirements for the senior institutions, nor can it be unduly influenced by the needs for two-year technical programs in the community-junior colleges.

In most instances, technical programs in community-junior colleges are rightfully designed for students who do not intend to finish a baccalaureate degree program. Most of these programs have been designed to prepare the student for the role of technician in an industrial society. The fact that a portion of students will terminate their education with the associate degree does not lessen the responsibility of leaders in community-junior colleges and senior institutions for cooperative action in the preparation of industrial education teachers.

There is no easy answer to many of the problems which exist. Obviously, if an industrial teacher preparation program is to be built largely on the technical offerings of the community-junior college, the technical preparation of teachers will be dictated, to a large degree, by the technical offerings of the community-junior college. Programs of this type, for example, will be unable to supply the profession with teachers of general industrial arts. There will also be gig gaps in the kinds of teachers prepared. For example, the community-junior college with no graphic arts facilities cannot hope to turn out teachers who wish to specialize in this area.

It will also be true that the kind and quality of teachers will vary with the geographic location of the senior institution and with the location of the community-junior college. Community-junior colleges in and around large metropolitan areas will, in general, provide a larger variety of programs and greater depth of offerings. Those in the suburban and rural areas will suffer greater limitation in variety and depth of offerings. Since students usually transfer to senior institutions from community-junior colleges in close proximity to the senior institution, there may be a different kind of teacher prepared in the less populated areas than in the areas with large concentrations of population.

The growth of community-junior colleges will also have a significant effect upon the four-year industrial teacher preparation programs in the senior institutions. In some cases, senior institutions may decide that it is not economically feasible to provide laboratories which may duplicate those available in community-junior colleges. For economic reasons, senior institutions may eliminate laboratory facilities altogether with a view toward offering prospective teachers only professional education courses. Certainly, the teacher who has been cooperatively trained by both the community-junior and senior institutions would not be qualified, in many cases, to teach general industrial arts. As a result, questions may be raised as to which institution should be responsible for preparing general industrial arts teachers for the junior high school.

This entire problem is complicated by the rapid change in the community-junior college movement as a whole.

Not only is there a dramatic increase in the number of community-junior colleges but also in the kinds of technical offerings. One has only to look at research completed in 1964-65 to find that, in the intervening three or four years, growth in the number of community-junior colleges in many states has been as high as 100 percent. Since this rapid growth will continue, no specific agreements made today could apply five to ten years hence. However, if there is to be an orderly transition, guidelines must be established now. Without them, a chaotic situation will develop in many states experiencing the rapid growth of community-junior colleges.

This study is presented not as a panacea for immediate ills or long-term growing pains. It is presented in recognition of problems that need to be solved and of the efforts being made by the extremely capable people from state departments, community-junior colleges, and senior institutions who are joining forces in outlining possible solutions.

The Problem

All states are suffering a severe shortage of industrial education teachers. The shortage is particularly critical in the very states which have had a rapid growth in the development of community-junior colleges. Because of the similarity in population, growth of community-junior colleges, and the demand for teachers; the following six states were selected to be included in this study: California, Florida, Illinois, Michigan, New York, and Texas. (See Figure One-1.) These six states were also selected because:

1. They are six of the nine largest in population in the United States.
2. They have about one-third of all the public community-junior colleges in the United States.

State	Total Population*	Rank in U.S.	Public Community-Junior Colleges	Sr. Institutions Offering Indus. Educ. Major
Calif.	18,400,000	1	84	11
Fla.	5,913,000	9	27	6
Ill.	10,600,000	5	34	8
Mich.	8,300,000	7	27	8
N.Y.	18,100,000	2	42	5
Texas	10,669,000	4	42	12

*Estimated 1968

Figure One-1

General Objectives

The principal thrust of this study is to examine approaches for utilizing staff, facilities, counseling services, and programs in the community-junior colleges for preparing industrial education teachers. The specific objectives are as follows:

1. To determine how the present technical offerings in the community-junior colleges in the six states correlate with the requirements for a degree in industrial education at the senior institutions in each of the six states.

2. To survey the problems of articulation which presently exist between the community-junior colleges and the senior institutions in the areas of curriculum, counseling, staff, and facilities.

3. To develop a guideline bulletin for improving articulation between the community-junior colleges and the senior institutions. This bulletin titled "Partners in Industrial-Technical Teacher Education/The Cooperative Roles of the Community-Junior Colleges and the Senior Institutions" will recommend innovative approaches for preparing industrial education teachers in the years ahead.

Scope and Method

The first objective was achieved by analyzing all the catalogs of all the public community-junior colleges and senior institutions in each of the six states to determine the kinds of technical courses that are presently offered in the community-junior colleges which may be useful in industrial teacher preparation.

The second objective was achieved by developing a series of instruments which could be used to survey problems of articulation that presently exist between the community-junior colleges and the senior institutions in the six states studied. Five survey instruments were used, and they went to the following groups:

1. Heads of industrial education departments in senior institutions. This survey instrument included a series of questions on topics such as evaluation of transfer credit, effects of transfer students on departmental curriculum planning, articulation of courses and programs, counseling and recruiting of transfer students, and opinions on those issues involving transfer students. (See Appendix for sample of this survey instrument.)

2. Admissions offices in senior institutions. This survey included many questions similar to those which appear in the survey sent to heads of industrial education departments to serve as a check on current practices in each of the institutions. (See Appendix for sample of this survey instrument.)

3. Directors of counseling in the community-junior colleges. This questionnaire was developed to determine the kinds of information needed by counselors in the community-junior college and also the kinds of assistance they desired from the senior institutions. (See Appendix for sample of this questionnaire.)

4. Transfer students presently enrolled in industrial teacher education courses. This survey was designed to determine the problems that students have who transferred from a community-junior college into an industrial teacher preparation program to obtain a degree. (See Appendix for sample.)

5. Directors of technical studies in the community-junior colleges. This survey was sent to determine what kinds of backgrounds the technical teachers in the community-junior colleges have which would make them qualified to offer basic technical courses for industrial teacher preparation. (See sample in Appendix.)

The third objective; namely, the development of a guideline bulletin was to be based on information secured through interviews, surveys, and research. In-depth interviews were held with representatives of professional organizations interested in the community-junior college and in industrial teacher education. During these discussions, a wide range of problems concerning industrial teacher preparation and the technical offerings in the community-junior colleges were reviewed. These interviews were held with the following:

1. President of the American Technical Education Association

2. Executive secretary of the American Vocational Association

3. Executive secretary of the American Industrial Arts Association

4. Staff personnel at the American Association of Junior Colleges

A careful and systematic review of all research in the fields of community-junior colleges and industrial teacher education was undertaken. This review includes a study of the monthly ERIC publications of "Research in Education" and "Abstracts of Research and Related Materials in Vocational and Technical Education." A complete review of research in each of the subject matter areas was developed. Information secured from the surveys and reviews of research were used for background information at the work-study conference held to develop the guideline bulletin. At this conference, selected leaders from state departments, senior institutions, and community-junior colleges from each of the six states were provided with this information

During the conference (held at Western Michigan University), preliminary reports were developed for the following areas: Focus on the Problem, Curriculum, Articulation, Staff and Facilities, Guidance and Counseling, and Student Transfers and Admissions. These preliminary reports were then reviewed and served as the basis for the guideline bulletin which appears in Section Four.

SECTION TWO
DATA COLLECTION

Examination of Community-Junior College and Senior Institution Catalogs

One of the first objectives of this study was to determine how the technical offerings in the community-junior colleges correlated with the requirements for a technical major and minor in industrial education in the senior institutions in the six study states. Catalogs from all of the community-junior colleges and senior institutions were collected. An informal survey of the technical offerings of the community-junior colleges and the senior institutions revealed that the major areas offered in the community-junior colleges included those of metalworking, drafting, and electricity-electronics. More limited offerings in the area of automechanics were available. Very limited technical offerings were available in such areas as graphic arts, plastics, and building construction. A second step was to make a more detailed analysis of technical courses offered by Michigan community-junior colleges and senior institutions. This was accomplished by the following procedures:

1. Analysis or progress charts were made for each of the technical areas, such as metalworking, drafting, electricity-electronics. Across the top of the chart specific course titles were listed and on the left-hand column the names of the community-junior colleges. Catalogs of each of the community-junior colleges were studied in detail and all technical courses listed under such areas as technical and industrial, applied science, and technology were evaluated. These were listed in the chart showing the total number of courses and the total semester hours of credit. For example, by looking at Figure Two-1A it is easily seen that community-junior colleges offer a large number of courses in descriptive geometry, while only two offer courses in automotive drafting and design.

DRAWING COURSES IN MICHIGAN
COMMUNITY-JUNIOR COLLEGES

Code: NC = Number of Courses
TH = Total Credit Hours

Figure Two-1A

	1 Descriptive Geometry		2 Engineering Drawing		3 Technical Drawing		4 Industrial Drawing Machine		5 Industrial Design		6 Tool & Die, Jigs, Fixtures		7 Electrical Drafting		8 Highway Drafting		9 Architectural Drawing		10 Blueprint Reading		11 Engineering Graphics		12 Technical Illustration and Sketching		13 Automotive Drafting and Design		14 Pattern Drafting		15 Related Instructional Courses		16 Elements of Surveying		17 Intro. Drafting		18 Product Design	
	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH
1. Alpena Community College			2	6			1	3	1	2	1	3					3	9																		
2. Bay de Noc Community Col.					2	8			1	4									1	2	1	4							1	2						
3. Delta College	1	3			1	3	2	6					1	2			11	47													1	3	3	C		
4. Flint Community Junior Col.	2	5	4	12							3	8					1	3	2	6			1	2	3	6	1	2					1	3	1	3
5. Glen Oaks Community College	1	3			6	26															1	3														
6. Gogebic Community College					4	15													1	3	2	6														
7. Grand Rapids Junior College	2	4	3	7	1	3					1	4					6	16													1	3				
8. Henry Ford Community Col.	4	4	2	2							8	10					7	16	5	5	1	1	9	18	6	8	2	2					4	4	1	1
9. Highland Park College			2	9	3	18					1	4									2	9							1	6						
10. Jackson Community College	1	3			2	6					3	23	1	3							3	8	1	1												
11. Kalamazoo Valley Comm. Col.	1	3			2	7	1	4			3	11	1	2															1	2			2	6	1	3
12. Kellogg Community College	1	3					1	3	2	6			1	3			2	6					3	9									1	3		
13. Kirtland Community College	1	3			3	9					1	3					3	9					1	3					1	3	1	3				
14. Lake Michigan College	2	6	1	3	3	9	1	3			1	4																	1	2	1	2				
15. Lansing Community College	1	3	3	9	1	2					2	6	3	15	3	12	9	36	3	9																
16. Macomb County Comm. Col.	1	3					2	6			2	6					2	5	3	6			13	33	3	16							2	5		
17. Mid Michigan Comm. College	1	3			2	5	2	5			1	3					2	6															1	3		
18. Monroe County Comm. College	2	6	2	5			3	7			1	3							1	2			1	2									1	3		
19. Montcalm Community College					2	8	3	16			2	14					2	14	1	3													2	12		
20. Muskegon County Comm. Col.							1	3			1	3	1	3			1	3					2	6			1	4	1	3			2	6		
21. North Central Michigan Col.	1	3	2	6	2	12	2	4																									1	3		
22. Northwestern Michigan Col.			3	9			1	3																							1	4				
23. Oakland Community College			1	3	3	9	2	6			2	6									2	6	1	3					2	6			1	3		
24. St. Clair Community College	1	3									2	6					5	23			2	6									2	6	1	3		
25. Schoolcraft College	1	3	1	3	2	13	1	3	1	5	7	47	1	3	2	6	5	37											1	3	3	17				
26. Southwestern Michigan Col.	1	3			2	16					1	4					7	24			2	6							2	6						
27. Washtenaw Community College	1	3			2	6	2	5			3	9					8	30			1	3	2	6					5	14	1	3				
28. West Shore Comm. College			3	9					3	12	1	4							1	3																

2. Identical analysis using the same course titles were made of the offerings in the senior institutions. (See Figure Two-1B.) It was clearly evident that the community-junior colleges offer a much larger number of technical courses and semester hours than are available in the senior institutions. The fact, for example, that in some Michigan community colleges a student could take as many as 26 semester hours in six specific courses of technical drafting illustrates the difficulty of transferring this large concentration of courses to a senior institution to prepare a teacher of drafting. The community-junior colleges also offer many specialized courses not available at the senior institution. For example, courses such as highway drafting, or automotive drafting and design are not a part of a teacher preparation program in the senior institution. The problem of transferring an over concentration of community-junior college technical courses in one area makes the transition difficult. A review of the comparative charts (See Figures Two-2A, 2B.) in metalworking indicates a similar problem. For example, one of the community-junior colleges offers five courses (23 semester hours) in machine shop. The maximum number of courses that any one senior institution in Michigan offers in machine shop is two, which total six semester hours. This is a particularly critical problem in planning a preparatory program for general industrial arts teachers.

   A comparison of course offerings of the community-junior college and senior institutions emphasizes the importance of articulation and coordination and also the need for developing a pre-industrial teacher curriculum for preparing industrial arts teachers. These detailed analyses are essential as background information for the counselors at both the community-junior colleges and senior institutions since they highlight the problem of transferring large concentrations of technical credit. These analyses are also useful in developing equivalency sheets such as shown in Figure Two-3.

INDUSTRIAL ARTS/EDUCATION COURSES
IN MICHIGAN SENIOR INSTITUTIONS
(Drawing/Graphics)
Code: NC = Number of Courses
TH = Total Credit Hours

Figure Two-1B

	1 Descriptive Geometry		2 Engineering Drawing		3 Technical Drawing		4 Industrial Drawing Machine		5 Industrial Design		6 Tool & Die, Jigs, Fixtures		7 Electrical Drafting		8 Highway Drafting		9 Architectural Drawing		10 Blueprint Reading		11 Engineering Graphics		12 Technical Illustration and Sketching		13 Automotive Drafting and Design		14 Pattern Drafting		15 Related Instructional Courses		16 Elements of Surveying		17 Intro. Drafting		18 Product Design		Industrial Arts	Industrial Education	20	
	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH				
1. Central Michigan University	1	3	1	3			1	3	1	2							1	2	1	1			1	1									1	2				X		
2. Eastern Michigan University	1	3			1	3	2	6									2	6													1	3	1	3				X		
3. Ferris State College	NO SPECIFIC COURSE LISTINGS OR SPECIFIC PROGRAM																																							
4. Michigan State University							2	4									1	3																			X			
5. Northern Michigan University			1	-			1	-			1	-					2	-			1	-																X		
6. University of Michigan	NO SPECIFIC COURSE LISTINGS																																				X			
7. Wayne State University							1	4			1	8					2	12											1	4								X		
8. Western Michigan University							2	6									3	8					1	3					1	2			1	3			X			

Figure Two-2A

METAL COURSES IN MICHIGAN
COMMUNITY-JUNIOR COLLEGES

Code: NC = Number of Courses
TH = Total Credit Hours

	MACHINE SHOP 1		METALLURGY 2		MANUFACTURING PROCESSES 3		QUALITY CONTROL 4		INDUSTRIAL MATERIALS 5		TOOL & DIE 6		JIG & FIXTURES 7		WELDING 8		SHEET METAL 9		FOUNDRY 10		FORGING 11		HEAT TREATMENT 12		ART METAL 13		RELATED 14		NUMERICAL CONTROL 15		TESTING 16	
	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH
1. Alpena Community College	5	43	4	11	1	3	1	2							2	6			1	3			1	3	2	4	2	3				
2. Bay de Noc Community College	3	13							1	4					3	13							1	4			3	12				
3. Delta College	1	3	1	3	1	3	1	3											1	3									1	3		
4. Flint Community Junior Col.	5	21	2	6	3	9	1	3	2	6					4	11			1	3					4	12	2	6			2	6
5. Glen Oaks Community College	5	23																														
6. Gogebic Community College					1	2									2	4											1	2				
7. Grand Rapids Junior College	2	16			1	6									1	4															1	2
8. Henry Ford Community Col.			2	2	7	9									11	14	11	13	3	3			1	1	2	6	4	6			4	4
9. Highland Park College					1	2			1	3															1	3						
10. Jackson Community College			3	6	3	9			1	2					4	10	1	4							1	3	7	13				
11. Kalamazoo Valley Comm. Col.	2	7			1	3					1	4	1	4													5	18				
12. Kellogg Community College			1	3	2	6	1	3																			4	11			1	4
13. Kirtland Community College	2	6	1	3											3	9			2	6							2	6				
14. Lake Michigan College			9	31	3	10	2	5																								
15. Lansing Community College	1	3	1	3	3	10	1	4							1	3			1	2							7	23				
16. Macomb County Comm. Col.	4	11	3	6	1	2					1	3			10	26			1	2			1	3			2	4	4	11	1	2
17. Mid Michigan Comm. Col.	4	16	2	6	1	3									1	2											2	6			2	4
18. Monroe County Comm. Col.	3	9					1	2	2	6					2	5							1	3	2	6	3	7			1	4
19. Montcalm Community College	2	18	1	3					1	3					2	18											2	6			1	3
20. Muskegon County Comm. Col.	7	21	1	3			5	15									1	3	5	16							3	9				
21. North Central Michigan Col.	NONE																															
22. Northwestern Michigan Col.	NONE																															
23. Oakland Community College					1	3	2	6																			6	18			1	3
24. St. Clair Community College	4	25	3	8	1	3							1	4																		
25. Schoolcraft College	5	27	5	16	3	17	1	4					3	25	8	32											4	11			3	8
26. Southwestern Michigan Col.	2	6	1	4					1	2	1	3			2	5											2	7				
27. Washtenaw Community College	4	13	4	12					1	3					5	20											1	3	2	4	2	6
28. West Shore Community Col.	3	9	3	12					1	3					7	20											1	3				

INDUSTRIAL ARTS/EDUCATION COURSÈS
IN MICHIGAN SENIOR INSTITUTIONS
(Metals)

Figure Two-2B

Code: NC = Number of Courses
TH = Total Credit Hours

	1 Machine Shop		2 Metallurgy		3 Manufacturing Processes		4 Quality Control		5 Industrial Materials		6 Tool & Die		7 Jig & Fixtures		8 Welding		9 Sheet Metal		10 Foundry		11 Forging		12 Heat Treatment		13 Art Metal		14 Related		15 Numerical Control		16 Testing		Industrial Arts	Industrial Education
	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH	NC	TH		
1. Central Michigan University	2	5			2	5									1	2			1	2														X
2. Eastern Michigan University					3	9			1	3															1	2								X
3. Ferris State College	NO SPECIFIC COURSE LISTINGS OR SPECIFIC PROGRAM																																	
4. Michigan State University	1	3			1	3																											X	
5. Northern Michigan University					5	-									1	-															1	-		X
6. University of Michigan	NO SPECIFIC COURSE LISTINGS																																X	
7. Wayne State University					1	8							1	4			1	4																X
8. Western Michigan University	2	6			5	14									1	3			1	3													X	

INDUSTRIAL EDUCATION EQUIVALENTS

W.M.U. COURSES I.E. Area	Sem. Hrs.	SOUTHWESTERN MICHIGAN (COMMUNITY) COLLEGE Tech. Area	Sem. Hrs.
Drawing			
120 Survey of Drafting	3	Enq. 101-Eng. Graphics Draft. Tech. 101-Tech. Draft	3 3
226 Industrial Graphics	3		
227 Technical Sketching	3		
231 Descriptive Geometry	3	Enq. 102-Eng. Graphics Draft. Tech. 201-Desc. Geom.	3 3
326 Advanced Industrial Graphics	3	Draft. Tech. 102-Tech. Draft.	3
330 Machine Drafting	3	Draft. Tech. 211-Tool and Die Design	4
331 Production Drafting	4		
520 Architectural Graphics	4	Draft. Tech. 111-Arch. Draft. Ind. Arch. 102-Residential Draft.	4 3
522 Laboratory Practices in Drafting	2		
ELECTIVES		Draft. Tech. 212-Ind. Study	3

Figure Two-3

Review of Research

Focus on the Problem

Teacher Supply and Demand

The present and future demands for vocational and occupational teachers are far greater than the supply. This demand is affected by a number of factors: the changing needs of the labor market demanding more skilled workers, more technicians in industry, medical and public service fields, and more semi-professionals; the development of new occupations requiring trained workers; the impetus given to vocational education at all levels by federal legislation; the growth of high school vocational programs; the increase in the number of area vocational schools; the increase in the number, occupational programs, and enrollment of community-junior colleges.

In a time of rapid technological and occupational change, vocational education must be in constant contact with the world of work. Occupations are constantly shifting. In the last twenty years, declines in employment in some industries have been great (farming, railroads, textiles, mining, lumber products, leather, tobacco, and petroleum). Even in industries that have been growing, some occupations have been diminishing.

The Occupational Outlook Handbook[1] points out the impact of technology, the rapid change in manpower needs, the growth of new occupations, and the rapid change to be expected in the future. The major industries producing goods are expected to need only a small increase of workers, but the service industries will expand rapidly. However, both the chemical and electronics industries will expand rapidly. The fastest growing group will be in the professional and technical fields. The demand will increase for engineers, scientists, teachers, office workers, administrative workers, sales workers, and skilled craftsmen. No increase is expected in the demand for laborers and little for the semi-skilled. Differential patterns of growth have implications not only for major occupations within each industry but also for the cities and areas within which the industries are located. Changing technology affects not only the numbers of jobs but also the skill content of the jobs. Changing geographical location of jobs is also an important factor. There are implications for a better educated and more flexible work force. A symposium in 1966 (Bemis and McClure)[2] brought out some of the relationships among occupational education, manpower, and economic change.

Surveys of manpower requirements and of projected demand, skill surveys, and other types of occupational surveys are carried out by national and state employment services, state departments, local agencies, and private groups. These point out the need for vocational education, suggest programs and courses or point out needed changes, and suggest needs for instructional staff. Burt,[3] in a comprehensive study of industry-education cooperation, points out both the fundamental deficiencies in these surveys and problems in their utilization by educators. Information is often incomplete and erratic. Change is often so rapid that it is difficult to predict the needs of industry five years ahead.

The employment service surveys are compiled from answers to questionnaires sent to employers and are liable to error from differences in definition, interpretation, and making projections on guesses merely to complete the form. However, since the Vocational Education Act of 1963 stipulates cooperation between local and state vocational educators and state employment service offices for relating training programs to manpower needs and since surveys are important in pointing out areas for further study, surveys do have their uses.

Another problem has been a duplication of effort with both educators and employment service, and possibly trade associations as well, gathering the same type of data from the same employers. The issue of the Review of Education Research[4] devoted to vocational education discusses theories, methodology, and a number of studies on manpower supply and demand. It is possible to estimate training and education requirements to meet occupational demands, but present methods for manpower projections are crude, unforeseen technical changes occur, and the data are often inadequate.

The authors caution against an overemphasis on meeting labor market demands at the expense of other goals of education. They question the ability to predict demand with sufficient accuracy for specific occupations; and in light of the high rate of occupational change and worker mobility, they question the value of too specific predictions as a basis for educational planning.

There have been a number of studies on the growing need for technicians. The Bureau of Labor Statistics of the U.S. Department of Labor[5] made a study of technician manpower. Total demand for new technicians (including replacement demand) was projected at one million for 1963-75. Insufficient numbers from existing training programs would still leave a gap of 400,000. The study concludes that the major source of new technicians will be graduates of post-secondary training programs and that there is urgent need for continued expansion of technical training facilities. The Office of Manpower Studies in Purdue University's School of Technology does continuing studies, issues reports, and sends out surveys on needs and changes in industrial and technical fields. The Engineering Manpower Commission issues reports on demand for engineers and technicians as well as detailed reports of enrollments in one-year, two-year, and four-year technical and engineering programs as reported in 1967 by Alden[6] which estimates demand to 1976 for technicians by industries. Enrollments are not sufficient to meet the demand. Bowen[7] states,that using the predictions of the Bureau of Labor Statistics of the anticipated need for trained technicians, predicted supply is less than one-third of the demand. However, he also says that these figures for demand do not include all areas in which technicians will be needed. The lack of supply tends to obscure the demand since industry finds other ways of filling the needs when it cannot obtain necessary trained personnel. He states that in 1975 there would be a deficit of more than three million technicians. There is definite need for industry and education to engage in public relations on a broad basis to upgrade the image of vocational and technical education and to encourage more students to enroll in technical institutes and and in community-junior college programs.

The Advisory Council on Vocational Education[8] in its 1968 report to the Secretary of Health, Education, and Welfare presents statistics for 1966 (the first year to reflect fully the impact of the 1963 Vocational Education Act). Total vocational education enrollments showed a mean of 31.3 per 1000 population, but there was a considerable range among the states from 9.0 in Rhode Island and 10.2 in Maine to 55.1 in Washington and 50.6 in Utah. Tremendous growth has taken place at the post-secondary level where enrollments increased 156.7 percent between 1964 and 1966 with an increase of 113 percent in the second year. Vocational education enrollments in secondary schools increased 43 percent in the same two years.

Between 1965 and 1966, post-secondary school expenditures were increased approximately 60 percent. The average expenditure per enrollee is three times greater than for the high school level program because of the difference in the types of programs and the amount of time per day the students spend in vocational classes. Most technical programs are at this level and they are characterized by high costs of material and equipment, lower enrollments, and higher instructional costs.

Trade and industrial education includes, besides the usual areas placed in this category, such programs as commercial art, cooking, cosmetology, fireman training (accounting for 8.5 percent of total enrollment), law enforcement, and tailoring. This category showed an increase in enrollment of 16.1 percent over 1965. New area vocational schools were opened. A noticeable increase in public relations activity throughout the nation has brought these programs to the attention of a larger number of people.

Organization of Manpower Development and Training Programs has encouraged states to organize similar programs on a continuing basis. Increased appropriations have made it possible to finance new programs. Increased demand for goods and services, and emphasis upon shortages of skilled craftsmen and other trained industrial workers have encouraged communities and schools to develop programs to meet this increased demand for skilled workers.

Melvin Barlow stated that the increase in enrollment for 1967 would be over a million new students, an increase of about 18 percent. (See Center for Research and Leadership Development in Vocational and Technical Education.)[9]

In 1966, approximately 92 percent of the schools (15,592) offering vocational education were comprehensive secondary schools. Vocational-technical secondary schools numbered 431, community-junior colleges 385, vocational/technical post-secondary schools 290, combination and post-secondary schools 186, and senior institutions 168. A national sample of 109 schools indicated that 683 new vocational education courses had been organized since 1963 in those schools.

There has been a continuous growth in the number of teachers over the last ten years. The percentage increase between 1965 and 1966 was greatest for post-secondary teachers (39.7 percent for full time and 43 percent for part time). The secondary programs showed a 20 percent increase for full-time and 20.9 percent for part-time teachers. In 1966, 33 percent of the vocational-technical teachers were in the trade and industry classification.

Projections to 1975 of enrollments, changes in their distribution, and needs were made in the 1966 report on vocational and technical education by the U.S. Department of Health, Education, and Welfare. While all levels will increase in enrollments, the proportion of total enrollment for each level will change with a decline of 22 percent for the secondary school and an increase of 22 percent for post-secondary programs plus a large increase for persons with special needs.

Significant changes will occur in the distribution of the total vocational and technical enrollments among various occupational categories in the coming decade. The share of enrollment of the agricultural and home economics students will decline sharply; 56 percent of the agricultural students will be preparing for off-farm occupations, and 20 percent of the home economics students will be preparing for gainful employment. Health occupation enrollments will increase more than five times, and distributive and technical education will more than triple.

Office occupations will more than double. Enrollments in trade and industrial educatin will increase almost four times from 1,269,051 in 1966 to 4,850,000 in 1975 in which year it will be 34.7 percent of the total vocational enrollment.

Approximately 200 new school plants will be required annually, or approximately 1900 new or expanded plants will be needed before 1975. Using the cost for a training station for one student, which in 1965 from an analysis of school contracts was shown to average $1,850 per student; the cost for new classrooms, shops, and laboratories will be about $85 million not taking into consideration rising costs. It was assumed that each training station served nine students, and the projected need would be for 1,467,000 new stations needed by 1975.

There is no doubt that the demand for teachers at all levels and in all occupational areas far exceeds the supply, but both educated guesses and figures based on surveys show a great deal of inconsistency. Projections of demand have also been made with differing results. There is still need for more exact knowledge of the demand for specific occupational areas and for geographic areas. In 1966, there were 124,042 vocational-technical teachers actually employed. The Advisory Council on Vocational Education[8] in its 1968 report estimated an increase in 1966 of 13.7 percent over 1965, although differences in reporting make exact comparisons difficult. This number is expected to increase by at least 150 percent in the next decade with the most rapid rate of growth being in post-secondary institutions. The U.S. Department of Health, Education, and Welfare (1967) forecasted a need for 213,300 vocational-technical teachers by 1970 and 350,000 by 1975. These figures were based on projected enrollments in secondary and post-secondary schools, growth of vocational facilities, industry demand, student interest, and figured on a student-teacher ratio of 45:1.

Two studies polled state directors of vocational education and came up with different results. The study by Hensel[10] showed demand in 1965 and projected demand for 1968:

		Demand in 1968	Percent Increase over 1965[10]
Technical:	Post-Secondary	4,633	39.7
Trade and Industrial:	Secondary	15,288	43.2
	Post-Secondary	7,705	30.5

The other survey by the American Vocational Association[11] reported 121,870 public school teachers and 6,641 manpower development training instructors were employed in 1966 and that a total of 165,152 teachers would be needed for 1970. Harris and Yenesco[12] estimated that the need for new workers with two years of post-high school training would be 120,000 per year and that immediate need for community-junior college vocational-technical teachers was 6,000. All of these surveys show the same faults as manpower surveys, chiefly those of not knowing what respondents' replies are based on whether all respondents are really defining terms in the same manner.

In New York City, the shortage of industrial arts teachers is so great that positions are being filled by those recruited from industry with a high school diploma, five years experience in a trade, and ability to pass the civil service examination. To obtain a permanent certificate, the teacher must work toward his degree; and to hold his position, he must complete 54 credits in five years.

Some examples given by Wenrich[13] for Michigan in 1965-66 point out the need for teachers. In 1966, there was a need for 634 teachers for new programs and by 1970, an additional 1,862 teachers will be needed in the state. The University of Michigan in 1965 received requests for 1,901 industrial education teachers (947 of these from Michigan schools) with only twelve graduates available for placement. In the state's seven senior institutions, only 164 industrial education teachers were graduated while there were requests for over 8,000 teachers.

Commenting on the demand for technical teachers, Suess (See Arnold, Erickson, and Suess.)[14] states "accurate information...... is extremely difficult to obtain. Educated guesses, the number of telephoned pleas for help in locating qualified staff, and similar 'empirical sources' currently indicate more positions than qualified personnel. Lacking, however, is a recent assessment of present and projected needs by technical specialty."[14] The Industrial Education Department at Purdue University undertook such a survey (reported by Suess) using a random sample of all 871 institutions offering technical training in the 1965-1966 edition of the Technician Education Yearbook.

Kinds and Levels of Teachers

The Vocational Education Act of 1963 specifically mentions the population areas for whom development of occupational preparation programs are to be established or expanded: high school; two/year post-secondary; out-of-school youth and adults needing training or retraining; and youth or adults with special needs, such as academic, socio-economic, or other handicaps. (This group includes the physically handicapped, the mentally retarded, the emotionally disturbed, the slow learners, the poorly educated, and the culturally and economically disadvantaged.) Programs for this group require larger investments of staff and allied resources than are needed for the other groups. Teachers need training and understanding for many educational levels and for diversified student populations.

There is a growing demand for information and exploratory programs covering not only an introduction to various types of vocations but also a study of the whole world of work. More industrial arts teachers with breadth of background and greater knowledge of business and industry, and training in how to teach this material will be needed for junior high, senior high, and even elementary schools. Vocational-industrial teachers will be needed for expanded high school, area vocational school and community-junior college programs as well as for both short intensive courses and extended programs for adults. They will also be needed for training youth and adults with special needs.

For each of these educational levels, specific teacher training is needed in the psychology and needs of the group, in orientation to the philosophy of the total education program, in planning curricula and instructional methods adopted to the level or special needs of the group.

At present these needs are being met in a variety of ways by manpower programs; job corps; "New Careers" programs for remedial work and training aides in public service occupations in high schools, skill centers, comprehensive community-junior colleges, and centers outside the skill system.

Dorothy Knoell's[15] study of New York's lower fourth of high school students and dropouts, particularly the urban disadvantaged, as well as high school seniors with no college plans with reference to the lack of opportunity for them in New York community-junior colleges is of special interest. The emphasis of the government's programs is on manpower need; the interest of the educator should be on the needs of students.

Technical teachers are needed for community-junior colleges, technical institutes, and area vocational schools. They are also needed for adult programs and are being hired by high schools who have begun pre-technical programs either for job entry at graduation or articulated with more advanced technical programs in community-junior colleges and technical schools. These teachers need a high degree of competency in their specialities with related work experience; but, since technical students must have about the same academic ability as students entering baccalaureate programs, they do not need the training required of the industrial education teacher in psychology and methods for teaching students of great diversities of ability and aptitude.

New occupations develop rapidly that require new knowledge and skills on the part of the industrial or technical education teacher. In the paramedical field, for example, many new programs are being planned as the needs for various types of technicians in this area are identified. Inhalation therapy, which had 38 students in 1966, is now being recognized as an important new field. A combination of mechanical, electronic, and basic medical knowledge will be needed for new hospital procedures. Arizona is working out a comprehensive program in the paramedical field to prepare technicians in a two-year program with courses that will be transferable for students wishing to obtain a degree.[16]

A new kind of technician needs to be trained in an electromechanical curriculum for the computer industry.[7] The role of the draftsman is being changed by new computer-controlled drafting machines and other new devices.

There will also be an increasing demand for work coordinators and for teacher coordinators of cooperative programs with the knowledge and experience to ensure that the work experience is an integral part of the student's training. There will also be a need for teacher educators; for teachers prepared to organize, teach, and advise in various short pre-service and in-service courses; and for administrative personnel.

There is a problem of semantics evident in the literature, in state certification requirements, and in school catalogs or references to the levels of teachers. There seems to be no clear-cut universal demarcation between industrial arts and vocational-industrial, and between the latter and technical. Many community-junior colleges and area vocational schools refer to all their programs as technological or technician.

Some high schools offering more advanced industrial courses in the last two years classify them as industrial arts and classify the teachers as industrial arts teachers. Burt discusses this problem: "in industrial arts the student is introduced to techniques and devices which, with further training, will be useful to him in industrial employment (He learns about drafting but is not a draftsman.), while vocational-technical education is designed to fit individuals into gainful employment as semi-skilled or skilled workers or as technicians in recognized occupations." [3] However, many educators believe that industrial arts can also prepare students for entry-level jobs as semi-skilled workers since the student may enroll in advanced industrial arts. Vocational education is usually offered in grades 10 to 12 and in adult programs. Evening programs are also offered for apprentice related and skill upgrading programs. Technical education is usually offered in post-secondary programs in technical high schools, area vocational schools, technical institutes, and community-junior colleges. However, these schools may also provide vocational education. The distinctions are becoming even more muddled with the development of skill training centers.

For the most part, industrial arts teachers are certified by the various states under the same provisions as teachers of other subjects with the requirement of a bachelor's degree with an industrial arts major and a number of education courses. Requirements as to the number of credits in the major, the minor, and education vary greatly from state to state. Some states specify certain courses. However, the shortage of teachers in this area as well as for vocational and technical education has created many kinds of provisional and special certificates with varying requirements as to the ways in which these may be retained and the courses required to obtain a permanent certificate.

There is even greater divergence for certification of vocational and technical teachers. Some states require from one to five years of work experience; some require work experience and a competency examination. There are no generalized standards. Some specify patterns of courses or college credits.

In general, a master's degree is considered desirable to community-junior college teachers and is required by states that make certification mandatory for community-junior college teachers. Only nine states require certification for some or all community-junior college teachers (Arizona, California, Florida, Illinois, Iowa, Kansas, Massachusetts, Missouri, and Washington). Again, because of the critical shortage of teachers, requirements cannot be adhered to and various sorts of provisional or special certificates are issued.

Allen (See Center for Research and Leadership[9] Development in Vocational and Technical Education.) summarizes the replies from 38 states, the District of Columbia, and Puerto Rico most of which had teacher certification requirements and teacher preparation standards. College unit requirements, however, ranged from 4 to 130. Two states required college units and workshops. Eight states did not have certification requirements, but they did have workshops or other activities for trade-technical teachers. Apparently, these replies referred to part-time and adult teachers also because most states require a degree for full-time secondary permanent certification with minimum credits set in general education, specialized, and professional courses.

In general, the technical teacher is expected to have advanced courses in mathematics and science with a bachelor's degree in engineering or a technology. Most of them acquire their educational qualifications in professional schools in areas of intense specialization and then have more specialized experience in business and industry. The various levels of teachers are not clearly defined by the states or the many school systems in setting requirements.

The need for changes in certification requirements is frequently mentioned. Silvius and Ford[17] concluded that those of Michigan need revision. Industrial experience should be required. Provision should be made for those who, while not possessing all the requirements, offer valuable experience, advanced specialized training, or unique experiences. Wenrich[13] in discussing the situation in Michigan states:

> We must re-examine our teacher certification standards as they relate to vocational and technical teachers. Since the community college teacher in Michigan no longer must have a certificate, such institutions are free to employ anyone considered competent to do the job; our high schools need the same freedom. If we do not make some needed changes in the certification of vocational teachers, we will force vocational education out of the high schools to be performed by other agencies of our society.
> ......Business and industry should question our present practice which places the emphasis on degrees, frequently at the expense of occupational competence.[13]

There seems to be general agreement that applicable work experience is a must for vocational and technical teachers and it is suggested as desirable for industrial arts teachers. "The concept of adequate successful work experience is deep rooted and is valid. It is through successful work experience that a person learns the skill, technical knowledge, and mores of the occupation he will be teaching. It provides the basis of instructional content. But work experience gives more than subject matter; it gives a teacher the insight into the occupational requirements to his instruction."[8] This same report states that a comprehensive review of state certification practices is needed. "An anticipated 150 percent increase in the number of teachers needed during the next decade makes it mandatory that states consider this problem a major priority item."[8] Flexibility without damaging standards of excellence is needed as the range of occupations and new types of programs (as those for the disadvantaged) widens. "Principles of teacher certification will need to be reinterpreted to establish the requirements of a variety of new teaching positions."[8]

"In short, the social and economic need for vocational education cannot be blocked by rigid certification requirements that limit the field of choice of potential instructors."[8] A system should be developed for preparing, employing, and certifying teachers who work at different levels, have different levels of preparation, and different kinds of teaching responsibilities. There are requirements of other external agencies that influence the institution's choice of teachers. These are[14] discussed by Defore (See Arnold, Erickson, and Suess). Regional accrediting associations have recommendations about faculty qualifications. Professional accrediting agencies, such as the National League for Nursing and the Engineers' Council for Professional Development influence both course content and faculty choice in some occupational areas. The federal government and state legislative acts and state regulations also influence standards for teachers.

Teacher Recruitment

With the current and greater future demand for vocational-industrial teachers and teachers of industrial arts, it is important to know the sources of the current staff and consider all possible sources for future staff. Beaty presents the following information about the sources of beginning trade and industrial, and technical teachers in 1965-66. (See Center for Research and Leadership Development in Vocational and Technical Education.)[9]

Industrial employment was the most important source for both groups and for secondary and post-secondary schools. A few teachers recruited from industry had a degree or were working toward a degree while employed by industry at the time they began teaching. Industry has always been the most important source for these teachers, who are identified on the basis of occupational competency. They begin teaching with a short pre-service or in-service professional education training and work toward a degree as they teach. The Council states that the fact the majority obtain their teacher education while they are employed as teachers rather than through the regular curriculum has come about because school programs develop in relation to occupation needs. Trade and industrial education are not static. Trade and industrial teachers must be recruited from industry when programs are initiated. Trade, industrial, and technical teacher education must be dynamic and flexible.

Parks[18] in interviews with 19 industrial teachers to determine their motivations for moving from industry to teaching found that the chief reason was a need for greater satisfaction in doing something for others. Some also mentioned greater security in teaching, but it was not the important factor.

In the recruitment of teachers from industry, educators frequently ask the help of advisory committees and other industry people. Industry may publicize the job in trade papers, post notices on company bulletin boards, or find a teacher through personal inquiry. The final selection is the responsibility of the educator.[3] F. Parker Wilber (See Richardson.)[19] also suggests asking help from the advisory committee in finding teachers. Night school teachers can be a source both for recruiting full-time teachers or for supplying information on possible teachers. Other teachers who have recently come from industry or who have maintained good working relationships with industry should be asked for suggestions. Wilber also states that colleges in large metropolitan areas that have acquired status and pay good salaries can often find teachers from advertisements. They do not have the problem of a small town school whose salaries are below those paid in industry.

New York City has been advertising extensively and has been recruiting industrial arts teachers from the crafts, requiring a high school diploma and competency in the subject matter. When industries shut down or move, there is a good opportunity to recruit teachers. Several were obtained when the Brooklyn Navy Yard was closed.[20]

Wenrich[13] in discussing short-range solutions to the critical shortage has suggested ways in which industry may help: encouraging former teachers now in industry to return to teaching, help in getting salaries raised, subsidizing salaries, helping to upgrade the status of the vocational teachers and working for improved facilities, good working conditions and smaller classes, and inducing experienced workers to consider teaching as a new or part-time career. These men can be identified and take some teacher education courses while still employed in industry. Work experience providing occupational proficiency should be as valid as a degree in this field.

In one of his case studies, Asbell[16] describes some of the problems that area vocational and technical schools in Georgia had in finding teachers. From one school:

> We got the tool and diemaker from across the street for the courses in machine shop. We got owners and foremen from other machine shops, union officials, and some working machinists. We needed drafting, but had to put it off for the first year because we lacked an instructor.[16]

Another school had a close relationship with Lockhead which has involved sharing facilities and instructors. From another school:

> Take electronics, for example. When we started the course, we looked for a teacher who had lots of experience in transistors, mircowaves, electronic control systems. It's hard to find a man with that kind of broad background. Most electronics men specialize. We found one who had been a specialist in radar. He knew his circuits all right, but he had to bone up on transistors. When he

> got to something like computer circuitry, he had to do a good bit of studying. We're always looking for people with experience, ability to learn, good moral character, and good speaking ability--everything that industry wants. The man we would like for each of our courses is making $20,000 a year somewhere in industry. For mechanical technology, the man we need has to be almost a mechanical engineer. Yet his beginning salary is $712 a month with a bachelor's degree. The two men we have now, both fine men, are teaching only because their jobs in industry caused them to travel too much. It's a constant search and a constant struggle.[16]

School boards have voted local supplements to state salaries to fill some jobs. In one school that was looking for an instructor in heating and air conditioning, the trade association of contractors voted to supplement the teacher's salary by $1200 a year.

The Manpower Program with about 8000 instructors in 1968 had problems of recruitment. Teachers vary greatly in background and skills and their ability to relate to trainees. They have been recruited through teacher organizations, the employment service, unions, and sometimes borrowed from local industry. A 1967 survey identified the chief sources as industry, retired persons from industry, retired teachers, and young people without prior teaching experience. The challenge of teaching adults and an experimental program are important attractions. Instructor retention, however, has been a problem because of job insecurity, delays in or gaps between programs, lack of fringe benefits, and long hours. Training has been mostly through orientation and in-service programs through the state education system with emphasis on the nature and needs of their students. Institutes and workshops have also been used in many states.[21] Former manpower teachers might provide a source for teachers, although only two from this source were reported by Beaty.[9] Frequently, the skill they teach is too specialized and they lack general background in the occupation.

The possibility of upgrading industrial arts or other teachers to teach in community-junior colleges or technical institutes has been considered. Silvius and Ford[17] found that the needed work experience and upgrading of technical skills might be a problem. Podesta[22] found that industrial arts teachers had some work experience and other possible qualifications. However, there is such a shortage of teachers at all levels that such a plan seems unsound. Nevertheless, Beaty[9] found this an important source with 122 high school and 103 post-high school teachers entering trade and industrial teaching from nonvocational teaching (presumably industrial arts), science, and mathematics. Sixty post-secondary trade and industrial teachers were recruited from the night school staff, which would seem to have good potential since they have some teaching experience and the school has some knowledge of their ability. Only one teacher came from a private vocational school.

Podesta[22] made a fairly detailed analysis of the private and proprietary schools in the county. Most of the teachers had educational and work experience qualifications equal to those of teachers in public school. These private schools reported no difficulty in obtaining teachers. However, these teachers showed no interest in public school teaching.

Small percentages of the new teachers in Beaty's[9] survey had come from the military services. Several studies have considered ex-military personnel a source for vocational and technical teachers, providing adequate selection procedures are used. Rogers[23] in a study of retired military personnel teaching in Florida community-junior colleges found them to be competent and suggested the military was a particularly good source for science and mathematics teachers. Bates[24] also studied the use of retired military personnel in community-junior colleges and arrived at somewhat the same conclusion as Rogers. Disque[25] reported that they are used to heterogeneous groups, have had varied work experience, have frequently been exposed to continuing education, and may have had formal teaching experience. However, they are used to a caste system, are not accustomed to public scrutiny, and may expect conforming behavior automatically. Richland and Rosove[26] concluded that there are thousands qualified both in education and occupational competence, but there is no systematic procedure for channeling them into vocational teaching. They explored the feasibility of developing a computerized system to match military retirees and job vacancies in vocational and technical education.

Spence[27] suggests women for some areas of vocational and technical teaching and locating those qualified teachers who never taught or who left teaching as possible sources. He also reported:"Why are we not recruiting more Negro youth?......Do we avoid visiting schools that are predominantly Negro? Here is a tremendous recource of excellent talent. Why do the counselors and faculty in the public schools not encourage these youth to follow this career?"[27]

Slightly less than one-sixth of the trade and industrial teachers at both secondary and post-secondary levels in Beaty's [9] survey and about one-half of the post-secondary technical teachers were from full-time college or university preparation. Moss[28] states that:

> Attracting prospective teachers from business and industry 'directly' into teaching might be the mode in some fields if the intent of the vocational-technical program is to provide terminal, highly specialized skills and if the urgency of teacher demand is perceived to be critical. Given a less urgent situation and a well-developed network of post-high school vocational-technical programs, the focus might be on creating a teacher education superstructure in which the best vocational-technical graduates can be prepared to become instructors.[28]

In preparing to meet long-range needs, Wenrich[13] suggests identifying students in high school who have the necessary interest and ability for good vocational teachers and encourage them to get the necessary education and work experience. Counselors must be aware of these career possibilities and college admissions officers must accept occupational credits. Community-junior colleges can provide both occupational education and the first two years of a degree program for future teachers. Teachers and youth organizations can help to arouse interest, and scholarships or other financial aids must be available, possibly provided by business and industry. Future teachers may also be identified in community-junior college occupational programs and among those completing apprenticeship programs.

The image of vocational education needs to be improved. It must acquire the same prestige as academic programs. Bowen[7] discusses ways of improving the prestige of technician education and the recent effort of the U.S. Office of Education and the National Industrial Conference Board to enlist the Advertising Council in a special advertising campaign.

The Role of the Community-Junior College

More and more it is the community-junior colleges "who are opening the door to higher education.......These colleges must respond to the widest range of talent and offer a broad spectrum of programs, including the liberal arts and technical and vocational subjects. The two-year colleges must enable a young adult to measure against the needs of society his ability and his willingness to work."[29]

There are three types of post-secondary institutions offering vocational-technical programs which may play a role in industrial teacher preparation. There is the technical institute type of school (private or public), such as the Los Angeles Trade-Technical College. There is the post-secondary area vocational-technical school, such as those recently established in the state of Georgia. Both of these types may offer a wide variety of programs at several levels including two-year quality programs from which future teachers might be recruited. The third type (which has had phenomenal growth in the past decade) is the community-junior college.

New legislation and master plans have been drawn up in many states for establishment of these colleges, numbers of schools and enrollments have increased rapidly, and there has been tremendous growth in both the number and variety of vocational offerings and enrollments in these programs. Federal legislation and federal funds both through vocational education and higher education acts have provided a tremendous impetus to this development.

Gleazer[30] estimated that in 1970 there will be 1,000 community-junior colleges with enrollments totaling 2,000,000 students. The community-junior college is expected to be all things to all people. Medsker[31] in 1960 commented: "No unit of American higher education is expected to serve such a diversity of purposes, to provide such a variety of educational instruments, or to distribute students among so many types of educational programs as the junior colleges."[31] Its diverse purposes are expressed in almost all the literature on the community-junior college and in state legislation and master plans. It is a two-year institution publicly financed and open to all high school graduates and adults providing:

Lower division or university parallel courses for transfer to a degree program
Occupational programs, usually considered terminal, of two-years or less, length, content, and level suited to the goal of the program or needs of the students
Various short courses to train or retrain workers
Adult and evening courses--general education, vocational, self-improvement
Remedial programs
Sound career and personal counseling
Community projects, programs and services of a cultural or civic nature[31]

Papers and discussion at a conference on the community-junior college at Lehigh University in 1965 focused on the ideals and uniqueness of this educational unit (Stoops and Guditus).[32] Emphasis is on the two years following high school, but it should be neither an extended high school nor a conventional senior institution. It should be a new kind of institution. It is a part of higher education when it is concerned with subject matter in-breadth and in-depth, is intended for adults, and is a part of the community of scholarship in its truly liberal sense. Its program must be determined to some extent by community needs, so one college is not necessarily like another. Since these needs are not static, the college must be flexible. While there should be an "open-door" policy of admissions, this policy should not apply to specific curricula.

The college can make a contribution through experimentation and innovation. The emphasis should be on good teaching, and the faculty must be able to judge its own competence. Faculty needs to have a diverse background of both educational training and occupational competency to deal with the diversity of programs and students, and to establish necessary working relationships with the community. Faculty should be trained in the community-junior college. Technical programs should train people for closely related job clusters rather than specific jobs and should be continually evaluated and changed in accordance with changing needs.

In the technical areas, faculty and counselors need to cooperate for specialized testing, assessment of student abilities, obtaining information on job requirements and employment opportunities, and in placement of students in courses and jobs.

Senior institutions with strong programs in the technical or vocational areas should lead in institutes or conferences of personnel from business or industry, senior and community-junior college teachers and administrators, and educational authorities to discuss and plan senior and community-junior college technical courses and methods. Senior institution degree programs for community-junior college technical teachers should also be discussed. Senior institution technical courses are often behind community-junior college programs in knowledge and use of current technical information. Some of these conferences should be held at community-junior colleges with up-to-date programs. Diversity of teachers needed for some of the special and adult courses is often so great that they can only be obtained from industry and receive needed in-service training.

Medsker's[31] study of the community-junior college published in 1960 was based on questionnaires, interviews, and a knowledge of the community-junior college scene. He discusses the growth, the ideals, roles, and realities of the community-junior college; its transfer and terminal functions, the large proportion enrolled in transfer programs compared to the actual proportion who transfer, the inadequacies of counseling and general education, the orientation of the faculty with reference to the stated goals of the community-junior college, and varying patterns of control, organization, and financing. The material on the community-junior college student and on the transfer student and the transfer program received more exhaustive treatment in later studies by Knoell and Medsker.

The transfer function involved special problems. Refusal of some senior institutions to accept courses identical with their own might force the community-junior college into offering the same courses as a particular senior institution and to abandon the development of interdisciplinary courses for general education needs; thus, causing it to lose its identity and right to experiment.

Medsker[31] found that the terminal function was limited more by student interest than by the willingness of the colleges to offer it. Few students are interested in a strictly terminal general education curriculum, and most terminal programs are occupational although including a limited amount of general education. Most such programs are classified as technical or semiprofessional. To meet both the needs of the community and of the students, the community-junior college should offer courses in trades at the skilled worker level.

The influence of the greater status of the academic transfer program and of the desires of students and parents in shaping the nature of the college is illustrated by Clark's [33] case study of the San Jose Junior College. It was conceived as a terminal institution(something of an extension of the technical high school) organized as a part of a unified school district, and its administrators were drawn from the local district and had both high school and vocational school experience. State policy, however, dictated an "open-door" policy. The character of the college changed with the first registration. Students wanted academic transfer programs. Industrial and technical programs became a very minor part of the day school but an important part of the evening school. The character of the student body affected curriculum, teaching, and the staff. Many students were of lower academic ability and achievement yet had a college degree as their goal. Most the teachers had secondary school backgrounds and were able to accept these students, but they found the wide diversity of interests and abilities difficult to handle in the classroom.

This student and staff background and the position of the college in the public school system made in many ways an extended high school, and yet it has a status as a college which must educate transfer students capable of acceptable performance at a senior institution.

The most important function of the college was really that of using counseling and course grade to influence students incapable of college work into terminal status,and yet this was a function that could not be presented as part of its public image.

Clark[33] found that the fact that the community-junior college was part of the public school system and that most of its staff had a secondary school background influenced the college. Staff members with a background of college teaching were more concerned with the status of the programs and a higher level of student performance. The vocational education backgrounds of the administrative staff were unable to exert much influence on the direction imposed by student desires.

Medsker[31] found a large proportion of the staff in colleges in unified school districts to have come from secondary schools in contrast to very few in state community-junior colleges and those established as extension centers of senior institutions. Most of the staff came from white-collar or farm backgrounds, whereas much of the student body was from blue-collar homes. A survey of the staff attitudes on the comprehensive concept of the community-junior college showed great variation in responses according to the type of control of the college, their positions in the college, their preferences as to type of institution in which they would prefer to teach, and the nature of their previous teaching experiences. The greatest acceptance of these concepts was by teachers in applied fields, teachers with secondary school experience; but the least acceptance was by teachers in extensions of senior institutions. Some academic teachers showed a tendency to identify with the traditional senior institution.

Hall[34] in a general summary of the goals of the community-junior college and its role in vocational education advocates the location of a new college in a district with a broad tax base, 2,000 high school students estimated to provide at least 400 for the college (which Hall considers the minimum), and no commuting distance for students of more than fifty miles.

Johnson[35] presents guidelines and necessary steps with details of some common procedures and sources of information and materials for administrators starting a new community-junior college. These were based on visits to newly established community-junior colleges throughout the country. Since state and local laws and regulations differ and the needs of communities differ, plans must be adjusted to these differences. He outlines procedures through the first year of operation with decisions that must be made, alternative possibilities, and problems which may arise in six areas: curriculum and instruction, staff personnel, student personnel services, finance, plant and facilities, and community services and relationships.

Morrison and Witherspoon[36] reported the actual procedures used by local officials, state agencies, and senior institutions in establishing local or state community-junior colleges, technical institutes, and branch colleges and extension centers and then identified the agency or individual responsible for each step. Their summary and evaluation of procedures covers the steps from genesis of the idea until the college is in full operation and uses the New York Plan as the basis for a suggestive outline.

There are several types of community-junior colleges and a great deal of variation. Richards[37] attempted to construct profiles that would permit descriptions and comparison of community-junior colleges. In a second study[38] he utilized the same method to make regional comparisons. Community-junior colleges developed in many ways (private, public, as part of the school system, and an extension of the senior institution, sometimes meeting in the evenings in the high school building). Sometimes a vocational school added academic programs. Sometimes an academic transfer institution developed into a comprehensive college. In the last few years, there has been an accelerated effort to expand education beyond the high school, to have low-cost, open-door community-junior colleges committed to serving many community educational needs within reach of nearly all school graduates. State master plans attempt to achieve greater coordination at the state level and to plan for the establishment of new community-junior colleges. Knoell and Medsker[39] state that the community-junior college "has been seized upon as the most likely institution for achieving the twofold goal of expanding educational opportunity and conserving the state's economic and other resources. The need to consider cost is clear from the expected size of enrollments, the size of the faculty and the building programs needed."[39]

The need to consider cost is shown in the proposal for cooperative education in community-junior colleges in New Jersey where an antiquated tax structure hampers development (Wooldridge).[40] The plan is of benefit to the student financially and educationally; but by planning alternate terms of work and study with employers alternating employees, it has a financial value to state and local budgets since more youth can be trained with less drain on the taxpayers. Twice as many students can be educated with the same capital outlay.

A study by Peterson[41] for the California Junior College Association and the California State Department of Education identified the needs as seen by the community-junior colleges. Of these, the five most critical were: concern for effectiveness and improvement of instruction; promotion and dissemination of community-junior college research and development; improvement in dropout evaluation procedures and techniques; evaluation of instructional offerings; and development of a sound and adequate pattern for financing the public community-junior college of California.

The community-junior college program operates under the influence of local, state, and federal administrative organizations, legislation, and funding. Federal acts in the areas of higher education and vocational education including federal funds available under certain regulations and usually through state agencies have had a tremendous impact in the last few years on the establishment and expansion of community-junior colleges and of their vocational and technical programs. State legislation, master plans both for higher education and vocational education, as well as administrative organization in both areas affect the organization and the program of the community-junior colleges. Many community-junior colleges while under state control with respect to many facets of their operations are also subject to local control either of a community-junior college district or as a part of a school district including elementary and high schools as well. Three publications are cited in the Bibliography which give insight into the types of organization, state control, methods and problems of financing, and patterns and problems of growth and development of community-junior colleges in the various states. Medsker[31] discussed in detail the development of community-junior colleges in 18 states and gave information concerning the types of districts empowered to maintain community-junior colleges, financial provisions, methods of the states to exert leadership, special problems in the development of the systems, and the role of the systems in the entire programs of higher education in the states. This was followed by a chapter comparing factors involved in various systems.

The Junior College Journal[42] in 1966 published a volume containing reprints of articles on developments in 20 states describing new legislation, new plans, changes, and growth. The Journal is a good source for current information in this area of rapid change. The American Junior Colleges edited by Gleazer[43] is a directory and also summarizes current trends.

Community-junior colleges may be part of both the public school system and the system of higher education. Local colleges may be part of a unified school system, a high school district, or a separate community-junior college district. Florida's community-junior colleges are all part of the county school systems, locally controlled and locally financed; but they are coordinated by the community-junior college division of the state department of education. The state provides total building costs. California's community-junior colleges have been of mixed type (some belonging to unified school districts and some organized as separate community-junior college districts dependent on local taxes and state and federal aid.) An argument for the unified district is that it provides better coordination of programs at all levels.

Medsker[31] found most teachers preferred the separate community-junior college district plan, and the recent trend in California has been toward this organizational form. Some of the criticisms of the unified plan were that unless the school administration was committed to the community-junior college, it might become the step-child of the system, have trouble obtaining funds for its programs, suffer under rules and regulations made for high schools, and have to contend with red tape.

Clark[33] also mentions these problems. California's community-junior colleges are legally part of the public school system and under its supervision at the state level as well as being part of the system of higher education. There has been controversy and discussion. Good examples of the community-junior college district pattern are those of Dallas and of the combined St. Louis City and St. Louis County. Primary funding is by the district with state and federal aid. Illinois' new law provides for community-junior colleges to be organized on the plan of separate districts coordinated by the Illinois Junior College Board and eligible for state aid from state funds for capital costs.[44]

Texas had conducted surveys and projected student enrollment by areas, establishing criteria for determining areas. Fifty-four community-junior college districts are planned, with some having more than one campus.[45] Until recently state aid was uncertain, changing with each legislative session and with no aid for vocational education courses until after the 1963 federal legislation. Community-junior colleges had also been administered with the public schools until recently when they were placed under the Coordinating Commission on Higher Education.

Michigan community-junior colleges are locally operated under district boards of trustees but receive state and federal aid and funds for capital expenditures. Their provision of vocational and technical courses are specified by law. At the state level, there is coordination through the Department of Public Instruction and by a state board for community-junior colleges.

In New York, there are state controlled agricultural and two-year technical institutes and community-junior colleges under the sponsorship of a local governmental body, both under the jurisdiction of the State University and a group of community-junior colleges in New York City under the City University of New York. Occupational programs had been emphasized from the start, but there has been an increased interest in transfer programs which has caused a continuous decline in the proportion of students in occupational courses.

In comparing community-junior colleges in New York, California, Florida, and Illinois; Knoell[15] commented that California had the most extensive and comprehensive system of higher education in the United States. Any high school graduate and anyone at least 18 years of age can be admitted to some program. Problems may arise from faculty counseling and poor articulation. California law specifies a full range of programs. The Los Angeles Junior Colleges offer an extremely wide range of programs of every type from short-term, skill courses to college transfer ones. Students may take only specialized courses or they may take these first and then the general courses.

The Florida system of two-year colleges brings almost every student within commuting distance of a college, and its very workable balance of local control with state coordination has made it a model for the nation. Although they have not yet reached the degree of comprehensiveness of California's older colleges, they have achieved a greater degree of coordination and communication with each other and with the total senior institution system. The Division of Community-Junior Colleges in the State Department of Education is responsible for this coordination. Miami-Dade Junior College (Florida) offers a complete range of programs for every type of student.

The intent of the Illinois community-junior college law and its 1964 master plan is that the community-junior colleges be truly comprehensive. They are organized separately from the common school system. The master plan emphasized transfer programs of college level, number and variety of courses leading to employment,and experimental programs for the undereducated. Both credit and noncredit courses may be offered. New York law, on the other hand, put emphasis on two-year technical and transfer programs and makes no specific reference to shorter courses or other types of programs. Short occupational courses are offered in part-time evening programs. The colleges have admission requirements, and the programs are considered to be of college level.

Some states have a state system of community-junior colleges. Massachusetts community-junior colleges are under control of a state board with no other responsibilities, and the financing and control are at the state level. This plan allows equality for all areas; poor regions do not have poorer schools. Colleges are also removed from local pressures. However, problems occur because of pressures from legislators wanting a college for their communities and from legislative control. Sites for colleges are donated by the region.

Rhode Island and Connecticut also have state systems. Virginia which formerly was served by two-year year extensions of several senior institutions is in the process of changing to a state system under a community-junior college board. Local boards act in an advisory capacity, and state funds may be supplemental to local funds and tuition. Courses may be established to meet local needs.[46]

The new Kansas state plan provides for not more than 22 community-junior colleges and suggests cooperation with senior institutions for certain educational offerings as a matter of economy.[47] Alabama and Minnesota have recently established state systems with full support and direction from the state under the community-junior college boards. In Georgia in addition to state community-junior colleges with some occupational offerings under control of the University System of Georgia, 18 area vocational and technical post-secondary schools have been established recently. Local communities pay half the construction and maintenance costs. The state pays salaries.

Another pattern of community-junior colleges is that of extensions of state senior institutions offering the first two years of senior institution programs. Kentucky, Ohio, Pennsylvania, Indiana, and Wisconsin are the states where this is most extensive. Community-junior colleges independent of the senior institution system are now being planned in Ohio and Pennsylvania. Wisconsin has a system of vocational and technical schools and 22 two-year small county teachers' colleges.

The extensions of Purdue University offer two-year technical programs. In these extension centers offerings tend to be limited and are the same as the University courses. Tuition is usually higher than on the main campus,and admission requirements are the same so that they do not really fulfill the purposes of a community-junior college. They are not low cost, open-door, and they do not serve a variety of needs and interests.

Community-junior colleges have benefited from federal aid. Much of the recent expansion has been due to federal aid for construction for community-junior colleges and technical institutes. Subsidy is also available for health and technology programs. In some states, community-junior have been able to expand their vocational and technical programs with federal funds available through state vocational agencies.

The importance of the community-junior college in training technicians and middle manpower is continually increasing. Harris[48] discussed this need and outlines occupations and programs to train for them. He stresses the need for training for a cluster of occupations so that mobility within them is possible. The federal administrative organization for vocational education and its relationship to the states is described in the report of the Advisory Council on Vocational Education.[8]

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Review of Research

Curriculum Planning
Community-Junior College

The increasing emphasis on the use of semi-professionals and technicians in many areas to assist professionals by performing many of the tasks formerly performed by these professionals has received considerable attention in recent years. This emphasis has directly influenced the development of many two-year programs in community-junior colleges and technical institutes to prepare workers for this level. The potential in this area has not been fully employed. There probably exists unidentified needs and possibilities for the development and utilization of technicians in whole new areas of industry, business, and the professions as professionals become more aware of those aspects of their work which can be performed by trained technicians. These new programs can most likely best be met by the community-junior colleges because they are the most rapidly expanding segment of education with an inherent commitment to vocational and technical education. However, occupational competence is not the sole aim of the community-junior college vocational program.[1] Approximately 50 percent of the course requirements for the associate degree are split between the areas of general education and basic theory, thus minimizing the danger of specialized skill obsolescence. Open-ended high school curricula preparing for either job entry or continuance at the community-junior college are being established in a number of schools. Major instructional fields in community-junior college are: technicians related to science, engineering, and industry; business; health-related; and public and private service occupations. High level technical programs may be accredited by the Engineers' Council for Professional Development, but middle-level courses preparing for middle-level technician jobs are better suited to the majority of community-junior college students. Expansion of existing programs in industrial and technical education, and development of new ones to provide training in emerging occupations means that the community-junior colleges, their staff, and those preparing teachers for these colleges or for technical institutes must be constantly aware of the occupational scene, of shifts, changes, and emergence of new occupations.

Attempts to provide staff in the face of quantum jumps in enrollment by 1975, might well lead to an over-all reduction in the quality of the faculty. Teachers are more apt to be trained for secondary schools or to teach what is taught at the lower level in the senior institution. They must be specifically trained for the community-junior college. (Harris)[1]

In the local area the community, the advisory committee, business, industry, and the school board and administration must all be cognizant of the needs and the possibilities of meeting them. Students and potential students must be aware of and interested in the programs proposed. The image of vocational education must be upgraded so that such programs will have sufficient status to be attractive to students, the community, and employers. Burt,[2] for instance, found that many employers including some on the advisory committees hire graduates of college preparatory programs rather than those from vocational programs because of the image of vocational students as being of a lower caliber. Several studies have reported the problem of interesting students after a program had been set up resulting in insufficient utilization of expensive facilities and equipment, and even the discontinuance of the program.

How is the vocational program determined? Some programs are common to a number of community-junior colleges throughout the nation--drafting, metals, graphic arts, construction, power and auto mechanics, technology, electricity, and electronics--and, for the most part, meet national needs or provide the basis for more specialized courses. Other programs are determined in various ways. Podesta[3] in his study of Santa Clara County found that the approaches used varied from just thinking it was a good idea to a combination of staff studies, occupational needs surveys, labor market information, and surveys of student interest. The advisory committee and an informal interschool coordinating committee were always involved.

In an effort to determine how community-junior college vocational programs are established, the Advisory Council on Vocational Education[4] analyzed responses from 109 colleges. The method indicates involvement of interagency and community resources. A majority reported at least one of three techniques for initiating new programs: local advisory committees, local community surveys, and state employment service information. Student interest surveys, requests from industry and business, and national survey data all played a role. Other sources were industrial associations, chambers of commerce, state and county surveys, employer interviews, visits to local industry, and state department of education personnel. Cooperation was established with business and industry, labor organizations, civic clubs, and others.

The use of advisory committees in vocational education composed of representatives of the professions (business or industry) and labor on a state and local level appeared as early as 1913 in legislation of Indiana and New Jersey. Numerous publications on their functions and organization have been issued by state departments of education, the American Vocational Association, and national trade organizations. In 1960, the Office of Education issued a comprehensive manual[5](while including material on general advisory committees) emphasized craft or occupational local committees. It describes various types of committees, their functions and organizations, and the conduct of meetings with illustrations from actual experiences. The Vocational Education Act of 1963 established a national advisory committee and required the organization of state and local committees. Although all states had established advisory boards, there were differences in organization and functioning. Most of the states in establishing the local advisory committees by legislative act, regulations of the department of education, or by a master plan followed the wording of the federal act. Michigan states that each instructional program must be developed with an advisory committee. The Florida plan requires the continual evaluation of local and community-junior college vocational programs in cooperation with advisory committees.[6] The Washington State Board for Vocational Education[7] is very specific in its requirements for the use of advisory committees in each broad occupational area and the duties as a coordinator of the local supervisor of vocational-technical education. It details method of selection and appointment, term of membership, provisions for meetings, etc. Adivsory committees are specified in recent state plans for the establishment of area vocational schools, in state legislation, or master plans for the establishment of community-junior colleges. Smith[8] in a national study of technical programs found that three-fourths of the colleges maintained advisory committees on curricula needs, conducted occupational surveys with their aid, and consulted with representatives of industry. In developing programs, the colleges reported that demand from local industry was the most important factor followed by local occupational surveys, student interest, and availability or financial support. A guide on the role of the advisory committee in occupational education for community-junior colleges was prepared by Riendeau.[9] With changing industrial patterns, advisory committees are essential to the planning and operation of good occupational programs. Three types of committees are recommended:

(1) General-advise on total program, occupational needs and priorities.
(2) Committees for specific programs to advise on employment needs, course content, facilities required, etc.
(3) Joint apprenticeship committee--besides advise, supervision of apprenticeship standards and on-the-job training.

A very comprehensive study of the actual functioning of advisory committees as well as more informal methods of industry-education cooperation was made by Burt.[2] He stresses the need for coordinating activities, developing cooperative relationships, and an understanding of the contributions of industry and education. Some schools have an occupational advisory committee for each program; for example, Los Angeles Trade-Technical College has over 50 and Denver Opportunity School has over 80. Effective formal industry-education cooperative relationships are still the exception rather than the rule. Effective committees need good leadership, either from interested individuals, from industry (frequently with some teaching experience), or from educators. Unfortunately, many of the latter do not have time nor experience. Many committees appear to exist only on paper. Some committees are organized for a specific purpose and some are continuing. There is often a lack of coordination between levels of programs and between schools in the same system or the same area. Each school may have an advisory committee for the same type of program with no concern for what other schools in the area are doing, thus making for both gaps and unnecessary duplication. Fragmentation of occupational education is common. What is needed is a comprehensive system for all youth and adults in an area that will utilize a general advisory committee composed of representations of all segments of the community. Special staff should be assigned from the superintendent's office to work with the committee which should act in an advisory capacity only. Occupational committees should be both advisory and operational. To be effective, the general committee should have all the facts presented to it and be aware of problems and deficiencies in the system. Examples are given of both successful and unsuccessful practices. Local joint apprenticeship committees work with the schools in providing related instruction for apprentices. Large schools may have as many as 20 of these committees and must provide coordinators to work with them. There are joint management-labor committees working with the schools under federal and state legislative sanctions and they frequently exert a great deal of pressure. The committees often provide equipment and subsidize instructors, but a problem may arise when they permit their equipment to be used only by apprentices who are selected by the committee. Educators can work with the committee members and attempt to change restrictive selection practices and also have school vocational credits accepted towards journeyman status. Texts and study materials may be provided by the union. They may select the instructor or provide funds for upgrading his professional and technical skills. Examples of such committees which operate effectively are given for Denver and the Milwaukee area where committees concerned with the whole area were able to standardize and upgrade programs in all schools.

In contrast to these committees, occupational committees are organized at the request of the school system. Burt[2] found that all the literature stressed their advisory nature but that good ones were operational as well; he prefers to call them cooperating rather than advisory committees. None of the literature gives an insight into actual situations and problems. The Los Angeles Trade-Technical College has been extremely successful with these committees, and Burt includes from their experience a procedural program for setting up meetings, minutes of annual meetings for one committee over a four-year period, and descriptive material on the study involved in setting up one program. A considerable amount of time is required by the school staff to make these meetings effective. In this college, cooperation is both formal and informal. Committee members visit the school, consult with teachers on special problems, award prizes to students, help secure teachers and equipment, advise on curricula, evaluate programs, recruit students, and employ graduates. Successful operation is based upon continuing formal and informal relationships, careful planning by school officials, and the assignment of staff to coordination. Comprehensive high schools whose principals and administrators are generally lacking experience in vocational education seldom use occupational committees, but in Pittsburgh and Los Angeles, for example, such committees are used by vocational education directors to give advice on vocational education for all secondary schools in the city. However, there is no cooperation of these committees with thosefrom the Los Angeles Trade-Technical College,and in Philadelphia there is no cooperation with the surburban schools. Industry-education cooperation should involve all levels of schools in an entire metropolitan area. There should be cooperation with adult, manpower, "war on poverty," and in-plant training programs. There should be representatives of industry and trade associations, large and small industries, and people actually responsible for training and employing workers.

A study by Dauwalder[10] of community-junior college advisory committees in the Los Angeles area illustrates the problems and the effect of committee membership on technical programs. Two colleges at first had top-level management on the committee. They recommended integral and differential calculus for electronic technicians. The following year engineering managers from the same companies were on the committees and recommended mathematics through trigonometry. The following year supervisors of technicians were utilized and recommended applied mathematics with special emphasis on the technical areas. "Currently these latter recommendations are being followed and the satisfactory placement of technicians has increased by 83 per cent."[10]

Essential to cooperation of industry and education is the industry program coordinator who must act as liaison between his instructors and industry and should be the force behind an effect occupational committee. Burt[2] discusses the duties of such coordinators and gives examples of how they are used in total public school systems and in vocational community-junior colleges. They are not common in secondary schools, although funds are provided for such positions. In an area school or community-junior college, the coordinator keeps in touch with the secondary schools and counsels students (He is frequently the department head.).

Local trade and professional associations are of great value to educators who should make every effort to establish good working relationships with their education committees and their executive secretaries. The U.S. Office of Education lists 212 national societies whose literature and membership activities are important to the school program. Some trade associations, unions, and professional societies employ educational directors who are responsible for developing instructional and career literature, films, and other teaching aids. Unions are chiefly concerned with apprentice and manpower programs and the retraining of workers. Burt[2] cites examples of the programs and educational materials of several national trade and professional associations, i.e., the Automobile Manufacturers Association; the Society of the Plastics Industry; the American Society for Metals; Manufacturing Chemists Association; the Council on Fluid Power Education; the National Tool, Die, and Precision Machinery Association; and the Education Council of the Graphic Arts Industry to mention just a few. Also involved in industry-education cooperation are area and state regional industry development commissions and Chambers of Commerce.

An example of close cooperation between industry and the Los Angeles area community-junior colleges in setting up courses for the space industry is described by Paul Ryan[11] of the Space Division of North American Rockwell Corporation. The article by Bowen[12] describes the efforts of IBM in identifying programs needed for employees in the computer industry and working with technical institutes in establishing these programs.

One of the stated aims of the typical community-junior colleges is that of offering education for employment in a program of two years or less. In determining what programs to offer, surveys of needs are frequently utilized.

Employment research by the college according to F. Parker Wilber (See Richardson)[13] should have four goals: to analyze present and future occupational needs in the local area where most graduates will seek work, to describe the essential competencies and standards required to meet these needs, to evaluate the extent to which the college is meeting them, and to identify new occupations and changes suggesting curriculum developments. The Michigan Study of Industrial Teacher Competence (Silvius and Ford)[14] reported that in the establishment of courses local, area, state, and national surveys should be considered but that the focus should be on occupational cluster. Mobility both geographic and within the occupation must be considered. Harris (See Richardson)[13] sums up the steps necessary for the initiation of a proposed curriculum. National needs can be determined from reports of the U.S. Department of Labor while regional needs can often be found from studies of the state employment service, chambers of commerce, local banks, etc. With advisory committees consisting of members at several levels in the occupations, a comprehensive survey of local needs should be undertaken. Spot surveys of specific areas and specific jobs should then be made followed by analysis of requirements for entry and promotion. The number of potentially qualified students who will be interested must then be estimated. Analysis of the cost and availability of facilities, equipment, and staff needed must be made. All these factors enter into determining the feasibility of a curriculum offering. Very specific forms of training should be offered only in the area where the jobs are located with assurance that graduates will be employed and that courses are geared to the employer's needs. Levitan[15] suggests some guidelines for the use of occupational data.

Practically all the literature concerning the functions of advisory committees assigns their involvement with making community surveys to determine instructional needs. Burt adds a word of caution:

> Despite these statements by the Office of Education and others, it is perfectly obvious that no lay group of citizens from industry, business, and the professions is capable of conducting a manpower and skill

> needs survey, much less analyzing and interpreting the results without the help of professionals. Before the findings of a manpower needs and skill survey are available for interpretation into a school program, a great deal of work must be accomplished.[2]

Burt devotes a chapter of his book to "Conducting Man-Power and Skill Needs Surveys" documented by case studies of surveys conducted by schools in cooperation with industry and the public employment service. No other area of industry-education cooperation calls for so much participation by industry, either formally or informally. Even when such studies are conducted by agencies or groups not directly connected with the schools, it is the employers who must provide the information. An occupational advisory committee can suggest the need for a study, specific questions for questionnaires and interviews, and review and consider the results of the study. They can assist in needed publicity and in urging participation of employers. A feasibility study may be conducted formally or informally by a community-junior college or its school system to determine the need for a particular program involving perhaps only one industry or occupation. Burt cites examples of three such surveys conducted by the Los Angeles Trade-Technical College to determine specific needs for precision instrument calibration and measurement technicians, metallurgical technicians, and motorcycle repairmen. Great detail was included in the survey instruments as to needs, salaries, hiring practices, job requirements, and specific knowledge and skills that should be taught in the courses. The Ohio State Department of Education has prepared details and procedures for conducting local surveys and provides professional help to local schools. The Florida State Department of Education has also issued a manual for conducting such surveys. Both states include programs for making parents and students aware of proposed courses and assessing student interest before intitiating a program. Another type of local survey is a total community survey backed by the Chamber of Commerce or civic groups covering all industrial and business needs as well as educational needs. Considerable interest can be generated in this type of survey and its results can be of value to both secondary school and community-junior college. Local or area skill surveys may also have been conducted by the state employment service, or it may be asked to cooperate in the local survey. Local surveys need to be in conjunction with state and national surveys both of a general nature and those relating to special areas. Studies by trade associations and professional groups are also useful. Industry groups in particular are apt to put pressure on the schools to establish programs for their benefit. All surveys need to be carefully interpreted. Among the questions to be asked are the following: Is the need a lasting one? Is it a real need or does it result from excessive turnover in the industry? Will the employers actually hire the school graduates? Since community-junior colleges depend upon the local area for support, their vocational programs are expected to be relevant to local needs. However, where there are wide-spread national needs, the community-junior college might establish some programs in these occupations. Harris and Yenesco[16] mention the popularity of electronics courses in Michigan whose industries do not have need for these technicians, but they are easily placed in other areas. Some community-junior colleges in areas where there is not much industry may offer programs for students who could not find jobs in the locality. One such school in New Jersey teaches glass-blowing for which there is a definite need elsewhere.

The Advisory Council on Vocational Education[4] reports about some of the studies conducted in various states. Colorado completed a study of current and projected occupational patterns in the Denver area reporting on a wide range of occupations and the job structure within them. Connecticut studied technician occupations designing the survey so that its findings could be used in program planning. Florida assessed facilities and finances in relation to programs. Illinois studied emerging occupations. Iowa completed a study of post-high school education to assist in planning vocational programs.

The use of surveys in Oregon, where vocational education and community-junior colleges are in the same division of the state's Department of Education, is described by Minear and others.[17] A skill survey by the state's Employment Service covering approximately 90 percent of the employment in the state was utilized as a basis both for planning and for determining the extent to which the need was being met by high school, post-secondary, and adult programs. The process of analyzing occupations for skill and knowledge requirements is continuous. Clusters of related occupations that appear to have common knowledge and skills have been developed. Total vocational enrollments in the state or local areas are then compared by occupational areas with projected needs. High school programs preparing students for an occupational cluster are being devised by cooperative effort of the state staff, advisory committees, and teachers. Some instructors spend part of their time devising curricula and then testing it in class. It is intended that these high school programs will be articulated with community-junior college programs in the same field. Vocational courses are determined with relation to the area and its needs.

Planning should allow for mobility. Mobility within the occupation comes not only through further training or promotion but also through technological or other change. Geographic mobility results from the shifting location of industries and employment opportunities and also from movements of people. According to the 1960 Census, four out of ten are working in communities other than those in which they attended secondary school.[4] According to the "Occupational Outlook Quarterly" for September, 1967, nearly half of the men in their forties and two of every five eighteen year olds moved to a different community. Migration was more prevalent among professionals and those who go away to college, but it occurs all along the occupational spectrum.

In determining whether a new occupational course should be given in high school or community college, Emerson[18] lists the following considerations: whether the greater prestige of the college is needed to attract students, the amount of previous preparation needed for successful performance in the program, whether a larger area than the high school is needed to attract sufficient students and provide funds for equipment, whether the maturity of the community-junior college student will be important for job entry, and whether adults will be interested in the program. Hall[19] also lists somewhat similar criteria.

Development of Occupational Curricula

A number of research studies related to curriculum development in industrial and technical areas are summarized in the Review of Educational Research.[20] The cluster approach determines families of occupations requiring related knowledge, skill and curricula which provides for adjustment to future changes and developments that may eliminate single skills jobs (Maley and Frantz).[21] Schill and Arnold[22] identified the core content of curricula in the electronic, electrochemical, electromechanical, mechanical, chemical-mechanical, and chemical technology fields. Mills and Rhamlow[23] also determined the tasks and knowledge clusters involved in the work of electronics technicians. Closely related to this approach is the transferability approach which attempts to identify the content needed, with a high transfer value for many types and levels of jobs, regardless of whether of not the jobs are in the same cluster or family. Roney[24] analyzed the interrelationships among mathematics, science, and technical subject matter of accredited curricula in post-high school technical institutions. Barlow and Schill[25] investigated the essential mathematics content of electrical and electronic technology. The competency pattern approach attempts to determine competencies needed in various occupational areas and might be particularly useful for emerging occupations. Another approach is that of studying the functions of industry. Stern[26] analyzed the functions of goods-producing industrial establishments as a framework for developing curriculum in industrial education. Lockette[27] in a review of 26 studies of curriculum content in industrial education found curriculum development lagging behind technological changes and recommended the use of subject-matter teams from the various specialities to work together to revise curricula in line with technological changes. Roueche and Sims[28] reviewed 26 curriculum studies in the community-junior college received at the ERIC Clearing House for Junior Colleges concerned with problems of determining the need for occupational programs, programs for low-ability students, status studies of curricula, and programs developed within the framework of specific objectives. One of these showed an interesting approach: Cabrillo College evaluated and altered its construction technology program with the aid of graduates and employers. Peidmont College developed a manual for planning courses around specified objectives.

In the development of a technical curriculum, there are a number of special factors to be considered. It must be designed to prepare students for entry into an occupation or cluster of occupations. However, job entry requirements or specific skills may differ with employers within the same industry. Educators must determine job content in terms of skill and knowledge requirements, but "must also rationalize the instructional program to meet the common and current needs of a majority of employers in their communities."[2] The community-junior college program may also need to meet requirements of state agencies, accrediting agencies, and senior institutions if the student is planning to transfer and continue work in the technology or enter the teaching profession. Advice and assistance from business and industry is essential in working out adequate programs. The complexity of developing and continually updating a vocational program is illustrated by the Dunwoody Industrial Institute.[2] Its instructors in consultation with industry are continuously involved in the curriculum process. It is the educator who must construct the actual curriculum. If he is fortunate, he may have the help of industry representatives with some teaching or curriculum building experience.

Suggested curricula and instructional materials are available from national trade associations, the U.S. Office of Education's Division of Vocational and Technical Education, most state departments of education, and senior institution curriculum laboratories.

Use of these materials in planning vocational courses can save duplication of effort although adaptation may be necessary to meet particular school or community needs. Burt[2] cites two examples of industry-education cooperation in continuous curriculum development. The Electronics Industries Association and Voorhees Technical Institute have cooperated since 1953 in developing curriculum, courses of study, and instructional materials in electronics for use by secondary and post-secondary institutions. The second example is the program for a metallurgical technician of the Los Angeles Trade-Technical College listing both technical and general courses, details of the suggested metallurgical courses, and recommended equipment.

What should be the level of a technical program? The nature and characteristics of the student body should determine this to some extent. Harris[1] says the term technical education is the most loosely used phrase in the literature of occupational education. To some it seems synonymous with post-high school occupational education; to others it refers only to programs related to engineering technology. He would define it as education leading to semi-professional or very skilled level of competence with a balance of theory and application, with a core of knowledge in science and mathematics, and including content in college-level general courses. He defines industrial education as preparation for the skilled, semi-skilled, or operative-level trades. Mathematics, science, and communications should be coordinated with the level and content of the technical courses to present the information when the student needs it. There are differences in the mathematics and science needed for the different technologies. (Harris[29, 1] and Roney[24]) Many colleges call all of their courses technical because the term has a higher status.

Geiss[30] in a survey of 229 institutions offering technical occupational programs to determine level, scope, and nature of these programs found no clear line differentiating "technical" programs; but they were characterized by greater emphasis on theory, more rigor, and possibly greater orientation toward science and engineering. Technical courses will have a higher status and schools tend to be more interested in these programs and to raise standards. However, three students will require skill level training and three more vocational level training for each one student who will achieve in a more rigorous technical education program. Dwyer[31] critizes the tendency of New York State's community-junior colleges to ignore their role as truly comprehensive colleges by neglecting lower ability groups. Most of these colleges have limited offerings on the same level of difficulty and frequently try to ape the senior institution. Dropouts are frequent and there is no provision for them to stay in school either by programs meeting their needs or by adequate counseling. The struggle of the college for status is again evident.

The U.S. Department of Health, Education, and Welfare has issued criteria for technician education concerned with quality post-secondary programs for specialized assistants to professional scientists and engineers. Technician occupations are described, lists of occupations given, and programs discussed with some illustrations of specific programs. The guide discusses problems involved in initiating and operating the programs, required physical and library facilities, faculty, student selection, and services as well as the curriculum. Technician programs are defined as rigorous two-year programs of a high level for students with good mathematics and science backgrounds. The post-secondary institution may offer pre-technical programs for students with ability who lack the necessary prerequisites. Typical jobs performed by various types of technicians are described. The curriculum should be planned to develop special abilities.

It is essential that any institution setting up a technician program have adequate financing for keeping facilities and library up to date. Library facilities and knowledgeable staff are a definite requirement. Before initiating a program, its feasibility in the area should be determined, there should be sufficient student interest, and consultation with employers and other schools running such programs should be undertaken.

Subject matter should be carefully coordinated in groups of concurrent courses which articulate smoothly. Laboratories are essentials as necessary skills cannot be learned in classrooms only. The typical curriculum provides a large number of laboratory hours in science and technical specialty during the first year as he should learn these techniques as early as possible. Total semester hours of laboratory classes should about equal classroom semester hours. Specialized technical course work should be introduced in the first semester to provide motivation, to show application of material studied in science and mathematics, and to allow time to develop the desired depth in the specialty. Basic science and mathematics should also be started in the first semester. The guide analyzes the type of mathematics, science, and related technical courses needed for various fields of specialization. A major special project should be required near the end of the curriculum

Technical courses must present a broad enough range of knowledge and capability to allow for mobility within the occupation and adaptability to change. The broad fields of technology are basically the same in any part of the country. In general education, communications skills are of great importance but should be related to the technical area. Economic and social aspects of living should emphasize financial management, important social organizations and interpersonal relationships. This should be taught as applied personal and social psychology. All of these courses should be taught by persons sympathetic to the technician's needs. Cooperative programs (if work can be found directly related to the student's program even though it may extend the training period) are of great advantage. Work experience must be under the supervision of the school.

The development of community-junior college occupational programs is dependent upon the high school preparation of students. This is particularly true of technical programs which cannot graduate competent technicians if the student does not have the necessary entry requirements. Remedial programs constitute one of the functions of the comprehensive community-junior college, and they are most often needed in English, mathematics, and science. The high attrition rate in technical programs as well as the comparatively small percentage of students entering them is in part caused by deficiencies in preparation. One solution is the pre-technical program offered in the community-junior college for promising but underprepared students. The U.S. Department of Health, Education, and Welfare has issued a suggested guide to pretechnical post-high school programs. The guide emphasizes that the school providing the technical program is the best equipped to provide the pretechnical training. Facilities, teaching capability, incentive, and an intimate understanding of specific requirements for the student's technical program are all parts of the institutions' daily preoccupation. Programs should be organized for two semesters but should be adaptable to individual needs. The student may need only one semester or only one subject. He should also be enrolled in basic technical courses,such as graphic representation not dependent on the knowledge in which he is deficient.

Science and mathematics requirements differ among the technologies. A two semester and an accelerated one semester course of study are suggested. The remedial classes should be for pretechnical students only, but they should study their elementary technical courses in the same classes as regular first-year technical students. The publication (see large bibliography) discusses administrative problems, selection of students, coordination of courses and teaching, qualities of teachers, use of visual aids, counseling, extra laboratory materials and facilities needed including learning and study skills, laboratory equipment, and special essential library materials. Programmed learning material and a center for its use is described.

Harris and Yenesco[16] discussed the problem of insufficient high school preparation for community-junior college technical courses. In addition, they made the assertion that the "new" mathematics and science taught in most high schools was not suited to the needs of occupational programs which required a laboratory and problem-solving approach. They suggested changing the course content in high school and providing a program for those planning to enter community-junior college technical programs. The articulation of high school and post-secondary occupational programs is receiving attention in a number of plans and pilot projects. Nearly all of these have required intensive work in curriculum building, teacher, and counselor training. Western Washington State College has developed a comprehensive curriculum in graphic arts starting with a two year high school program stressing the science and technology of visual communications. In twelfth grade there will be special training for those planning to enter industry, but the program is primarily planned for articulation with a community-junior college. San Bernardino Valley College and ten high schools in Project Accent coordinates counseling and instruction in grades 11 through 14 in auto mechanics, applied electronics, and office occupations. Oregon is attempting coordination of high school and community-junior college occupational courses on a statewide basis through state and local occupational surveys, the organization of courses in the last two years of high school on a cluster concept providing education for families of jobs, greater specialization in community-junior college, and exploratory courses in the ninth and tenth grades. Discussion in New York--see Brick[32]-- has revealed the complete lack of coordination of secondary and

and post-secondary programs in electronic technology, mechanical technology, and business occupations and the great differences that exist in the programs offered by the various schools. A great deal of work involving a high level of cooperation must be done to improve the situation.

Adequacy of Occupational Programs

The whole question of adequacy of community-junior college programs is related to many questions of evaluation -- adequate for what, who evaluates the programs, by what criteria and how are results interpreted. Since the primary purpose of these courses is job preparation, a common practice is the very unsophisticated one of placing a number of available graduates in entry jobs. Both Venn[33] and Harold T. Smith[34] have raised questions of adequacy of preparation for life other than the acquisition of job-entry skills. Moss[35] in a review of research found:

> In addition to ratings based upon subjective judgment of 'experts' there were at least six additional criteria used in evaluating vocational and technical programs ... number employed in the occupation or related occupation for which training was provided, achievement in subsequent formal training, number of people served in relation to the need for service, achievement of theoretically derived purposes, graduates' opinions, and opinions of professional persons within the program.[35]

Members of the advisory committee who employ, train, or supervise graduates or cooperative plan students are familiar with the school program and are in a good position to judge the program. Frequently, evaluation between these employers and the instructors may be continuous and informal. Advisory committees can assist in program evaluation but only with sufficient understanding and time. Burt[2] gives examples of some advisory committee evaluation reports of courses, instruction, equipment, and teachers.

Dunwoody Institute (See Burt.)[2] does not use advisory committees but does use consultants who are carefully selected. These consultants are often graduates of the school and have been extremely successful as evaluators of the programs.

The Florida State Department of Education[36] has issued a program for accreditation and evaluation of local programs that resulted from cooperative efforts of personnel in evaluation, accreditation, and the state division of vocational education. Ratings are to be assigned to specific aspects of the program according to three specified levels of operation. The proposed system is being field-tested. Value judgements on process and product of programs are inherent in the system. These are necessarily subjective, although they reflect the results of experience and the decisions of experts. These judgements are being applied to adult programs in vocational and technical education.

Matteson,[37] in a study by questionnaire and interview of all those completing courses at three California community-junior colleges three years previously, discovered that the community-junior college program did aid the student, although most of them had been in transfer programs and 90 percent said that if they returned to school it would be to a transfer program. Most students found local work almost immediately. For this group, better guidance and more specific vocational training was indicated.

Sweany[38] and Smalley[39] both suggested questions to be asked in program evaluation that could be applied to some extent to particular courses or curricula. Sweany recommended continuous evaluation with relation to: placement of graduates, teaching support functions (including counseling and administration), availability to students, quality of program, adequacy of coverage of different fields, changes required in keeping up-to-date, effectiveness of teaching methods, efficiency of learning, comparative costs of programs, and use of funds. Smalley poses questions: What kinds of students take industrial education courses? What are former students doing now? What is being done with some of the latest educational developments? What relationships exist between objectives and evaluation? What groups of students should industrial education serve? How do we compare with other schools? What is the image of industrial education?

Dorothy Knoell[40] discusses another factor in evaluating the occupational programs of the community-junior college. Concern has been shown as to adequacy in meeting the needs of industry, but how adequate are they in meeting the needs of students? Attrition rates and the number of students with transfer as their goal points to the need for greater study in this area.

For prospective teachers planning to transfer, evaluation of the vocational and technical community-junior college courses must consider not only content and level, theory, concepts, skills taught, relevancy to the occupational area, but also their articulation with specialized senior institution courses.

Teacher Aides

When there is a teacher shortage, the use of teacher aides to do many of the jobs not requiring professional training has proved effective; and they are being utilized in many elementary schools. Senior instiutions make use of student help for some of the chores connected with teaching. There is no reason why high school and community-junior college instructors should not have trained laboratory and technical assistants to assume responsibility for laboratory assistance, preparation of materials, keeping equipment in order, and other routine tasks. Associate or bachelor degree programs might be established for teaching and related educational assistants. Libby and Cosaud[41] caution that such a program would have to be flexible to accommodate the background and competencies of the individual as well as the role for which he is preparing. Laboratory technicians can be recruited from high school graduates with experience in the specialty or from students in technical courses in the two-year programs who would normally be seeking an associate degree.

Experienced technicians may be used as staff assistants. Assistants may be used in stock control, care of equipment, routine grading, etc.

> Resourceful use of support personnel makes possible the use of a small but versatile staff which may be maintained as enrollment varies.

> By adjusting the size of the support personnel staff to the demands of enrollment, a school may, to a degree, adjust the problem of having too few instructors when the enrollment is high and too many instructors when enrollment is reduced.[42]

It would seem that a community-junior college program to prepare teacher aides for junior, senior, or post-high school vocational education employment could be devised, but no formal example of such a program could be found.

Senior Institution - Teacher Education

The typical pattern for vocational teacher education programs includes the following:

> General or liberal arts education, the same as for other prospective teachers - 30 to 50 percent of the program.
>
> Technical or subject matter courses, usually taught in the major departments or schools. Related or cooperative work experience may also be required.
>
> Professional education - 10 to 20 percent of (the) program. May include foundations of American education, educational psychology, special methods, and student teaching which is usually in the public schools.[4]

The actual program and number of course hours varies according to the requirements of institutions, departments, regional accrediting agencies, and state--general and vocational specifications. The emphasis is on preparation of secondary teachers, but the post-secondary teacher may take additional technical courses and advanced work in teaching; and the full-time adult teacher may have a course in adult education.

Trade and industrial teacher education programs have special problems since the majority of their teachers obtain their subject matter competence by following their occupations and obtain their teacher education while they are employed as teachers rather than through the regular curriculum. Work experience has special validity in this area, not only for providing occupational requirements. Programs for educating these teachers must be dynamic, ever alert to needs for change, for revision and adaptation of course content and methods.

Harold Smith[34] emphasizes the need for relevancy in professional courses; ...... "the usual teacher education courses required for vocational and technical teachers should be confined to those that are relevant."[34] The Advisory Council on Vocational Education[4] comments on the development of teacher education on the basis of occupational categories and suggests the need for some courses for all vocational teachers to foster the concept of a broad view of vocational teacher education.

The Advisory Council on Vocational Education[4] summarizes some of the changes and emerging practices in vocational teacher education.

1. More flexible curriculum permitting either broader knowledge of subject matter or greater specialization.

2. Content of courses has been changing. Trainees are prepared to plan curricula, prepare instructional programs and materials, and plan employment experience programs for new and expanding occupations.

3. New Courses in professional education and in other fields. For example, separate courses have been added dealing with the methodology of preparing workers for employment in specific occupations.

4. Employment experience programs have made necessary closer cooperation with personnel in other fields and in guidance. Several services are involved in both preservice and inservice programs.

5. Special workshops and conferences are being held for employed teachers to improve their competence in working with new phases of their programs.

6. Microteaching

7. Teacher education staffs have become more research oriented and have conducted studies of employment opportunities, or specific job classifications, etc.[4]

The Advisory Council on Vocational Education[4] recommends attention to the following considerations in teacher education:

1. Stipends for those preparing to teach and to assist participants in inservice programs.

2. Regional teacher education centers for states unable to maintain an adequate program alone.

3. National proficiency tests of occupational competencies to determine what a teacher has or needs.

4. Regional center for instructional aids and materials although some aids will still have to be developed locally.

5. Continuing use of local teachers as supervisors of student teachers but with higher standards in their selection and with workshops or conferences for them.

6. Reimbursement for schools to hire teachers and allow some training time for them before they start teaching.

7. Strengthened national leadership for teacher education.[4]

Other recommendations include:

1. System of preparing and certifying teachers with different levels of preparation and different kinds of teaching responsibilities.

2. Study of amount, kind, and ways of providing practice teaching and occupational experience.

3. Critical analysis of new teaching techniques, as programmed learning and television, in vocational education. Excellence is important.

4. Provision for prospective teachers to gain more experience in working with many types of youth and adults, to get acquainted with various kinds of social and economic living conditions, and to work in different situations.

5. Courses to prepare teachers for post-high school programs.

6. Greater individualization to permit those entering teaching from other areas to take preservice programs tailored to the areas in which they are lacking instead of requiring them to take a program for required credit purposes only. If they know much of the elementary work included in undergraduate program even though they do not have formal credit for it, they should be able to go on to work of greater depth.[4]

In relating what should be taught at different levels to the teacher's preparation Silvius and Ford[14] in the Michigan Study of Industrial Teacher Competence interviewed representatives of Michigan's geographic areas, administration, teachers, counselors, labor, and industry. At the junior high level, they would keep industrial arts as an exploratory program and suggested more knowledge of industry and labor, elements of design, home repairs, auto mechanics, and some knowledge of automation and problem solving. Teachers should be trained specifically for the junior high school. They should have courses in the psychology of this age group, a broad background in other areas, particularly science and mathematics, and some work experience as part of the training. Too much time is devoted to nonessential professional courses at the expense of additional technical and manipulative experiences in industrial education.

There was considerable disagreement among the respondents as to the content of the high school program. A broad general background with good preparation in science and mathematics and avoidance of too early specialization was favored by many. For the student who expected to enter the job market upon high school graduation and who had identified his occupation, more intensive skill training combined with work experience was suggested. Work experience was considered essential for the industrial education teacher in high school, with more being needed by the teacher in the area vocational school; it should be an integral part of his preparation. The number and depth of technical courses, additional science and mathematics courses, were considered more important than too much emphasis on professional education courses.

There appears to be general agreement that community-junior colleges should provide preparation for industrial or engineering technicians and the related instruction for apprentices. Basic training for non-apprenticed trades can be provided, but some believe that it belongs in adult education program or in the high school. Transfer technical programs should be provided if the senior institution cannot meet the need, but there seems to be some feeling that this preparation should be done at the institution offering the complete program. Divergence is great on the preparation of teachers for community-junior college. Relative to professional education courses, opinions varied from a course of a few weeks to about one-fifth of their preparation. Most people agree that technical competence and industrial experience are the essentials for such teachers.

Many of the programs for training or retraining for specific jobs and the MDTA programs are of such a nature that the average industrial education teacher would not possess the specific skill. Teachers must be recruited from those actually doing the work. For these, inservice training directly applicable to the work is needed. Unless such a teacher plans to make a career of teaching, formal academic requirements should not be stipulated. Areas that were proposed for study were: (1) the development of an internship program utilizing team teaching with a professional teacher. The intern would be pursuing part-time study at a community-junior college and finally at a senior institution that would lead to a degree. (2) a program to train industrial education teachers in vocational guidance so that they might be better able to assist their students in this area; (3) the use of the same facilities and classes for undergraduates, technical students, and teachers in-service as are used for technicians by the Detroit industries; (4) developing a seminar on the role of labor and management to assist teachers in devising curricula and instructional methods for presenting this material in their classrooms; (5) identification of companies regularly conducting training courses for industrial personnel and arranging for prospective and inservice teachers to participate. Wayne State University has both cooperative work study and field experience courses in which students utilize their experiences in industry to develop teaching materials for a specific teaching situation.

For prospective industrial arts teachers, Oswego College in New York[43] has developed a program of field study in industry for seniors who had completed practice teaching. First tried as a pilot program in 1964, it was revised and expanded in 1966. The project aimed at developing a course model and the accompanying instructional materials for an inductive study through classroom and actual observation in industrial organizations of the concepts, organization, and operation of industry. As the study progressed, students organized course and resource materials for interpreting industry to their future students. The first week on campus covered the history of industry and labor, industrial and labor organization, industrial psychology, sociology, and economics. This was followed by six weeks of concentrated field study and observation of industrial relations, engineering, production, labor, financial control, and marketing. The last two weeks back on campus were devoted to a curriculum development workshop where major concepts and information gathered during the industry phase were discussed and developed into resource units. The student workbook not only lists assignments but allows for the organization of notes on lectures, discussions, and observations, -- the development of concepts, answers to specific questions about companies visited, information and specific jobs, and the collection of curriculum materials for teaching. An outline is provided for the information to be obtained from a visit to a company.

The test used and examples of curriculum resource units are also included in the appendices. The course required an instructor, coordinator, and an industrial coordinator in each establishment utilized for the course. The list of cooperating industries is given with the guide for industrial personnel who would be talking to the students.

Most technical teachers will be teaching in technical institutes and community-junior colleges and need professional education courses suited to this level of teaching. In general their students will be adults or high school graduates of average or above ability. The report of the U.S. Department of Health, Education, and Welfare on criteria for technician education[42] describes the competencies and preparation of a technical teacher.

Technical teachers should have competence and understanding in their field greater than the subject content they will teach. They must have a comprehensive understanding of the applicable scientific principles and phenomena, a working knowledge of all apparatus, methods, etc. in the field, ability to perform as a skilled technician, and ability to teach interpersonal relationships and skills needed in the field. Usually subject preparation is acquired in professional schools, but it has been found that increasing emphasis on theory in many areas does not prepare the recently graduated professional to be "either educationally or psychologically capable of teaching technicians."[42] The best teachers will be graduates of technician programs with suitable employment experience, who then continue their studies to professional level. They are more likely to understand the objectives and unique instructional requirements of technical education. They should also have formal courses in vocational and technical education, pedagogy, and practice teach in technician programs. From three to five years of recent employment experience involving the matter they will teach is mandatory. Continuous study of new methods and development of new materials in the field is necessary.

At present there are very few technical teachers who are products of an organized degree technical teacher education program. Baccalaureate programs are in operation at Oklahoma State University, the University of Illinois, Purdue University, and a few other institutions. The report by Arnold, Erickson, and Suess[44] on the 1967 summer institute at Purdue University on technical teacher education developed the following guidelines for a teacher education program:

> 1. Acquisition of technical knowledge of greater depth and breadth than in courses likely to be taught.
>
> 2. Mathematical and scientific knowledge appropriate to the technology, level and emphasis in which it is to be taught.
>
> 3. Appropriate occupational experience based on the needs of the technology, in some cases allowing the major portion to follow graduation from the teacher education program.
>
> 4. The ability of the technical teacher to communicate with students, his peers, educational administrators, and the public.
>
> 5. Elective and course selections from the social sciences as basic to becoming responsible, participating members of society.
>
> 6. An integrated sequence of professional content which focuses attention on the adult as a learner and includes an appropriate student teaching experience.[44]

Since successful employment in a technical occupation is the goal of the community-junior college program, the teacher must be able to relate the courses to the future job function. He must teach both the theoretical basis and the applied content. The amount of technical knowledge and competence and the constant need for keeping up with current developments may make for narrowness in outlook. For this reason, some courses in the humanities, social, and behavioral sciences are necessary. Mathematical content for the technical teacher should be based on the technical programs he is likely to teach. Identical titled curricula in different institutions may have dissimilar mathematics requirements. The teacher's preparation should be geared to the more complex mathematical requirement. The courses should emphasize approaches to the solution of technological problems. Science courses should be taught with laboratory oriented problem solving approaches. Technical content should be integrated with science, mathematics, communications, and professional courses. It should be continued through the entire program so that he will begin teaching with more current technical knowledge. Work experience should be directly related to the material he will teach. The supervised, cooperative type of work experience with carefully arranged placement is to be desired. There should not be a blanket work experience requirement. The amount and emphasis of this experience should relate to the technology, the level of the program, and the courses likely to be taught. The experience could be obtained after completion of the degree and some might be obtained during summers while he is teaching. Professional courses should be based on the adult as a learner. An integrated sequence of courses from the nature and problems of technical teaching through educational psychology, course construction, etc., should emphasize practical classroom and laboratory situations. Teaching and demonstration in his own technical courses can be used to show him how to teach others. From the point of view of economy and greater ease in administration, student teaching is easier to provide; but a carefully planned and operated internship may be more valuable to the student. Even using these guidelines, technical teacher education programs will differ from one institution to another. All programs require cooperation between the Departments of Education and Schools of Engineering or Technology. Unless the senior institution has a school of technology, advance course work must be in engineering. At Oklahoma State University the Oklahoma Technical Society is influential in determining standards and requirements.

In planning for the preparation of industrial education teachers, there are a number of problems not encountered in technical teacher preparation. The lines between industrial arts and industrial education are not clear, and there is also confusion between industrial and technical education. The industrial education teacher may teach at the secondary or post-secondary level; and in the latter, he may be teaching at several levels and in several types of programs. He teaches a wide diversity of students. He may teach adults or students with special needs. State certification requirements, degree requirements of the teacher training institution, and relationships of the institution where he may teach to the various state vocational and education agencies complicate the problem of curriculum development for these teachers. The majority of teachers have come into the field from industry and have obtained occupational competency through work experience; thus, restricting teacher education to professional and general education courses plus in-service programs for up-dating course content. Training may take place in a short pre-service program or through an in-service program and may be under the direction of the senior institution, state teacher training staffs, or other arrangements. There is great variety in organization, content, and duration of these programs. North Carolina and Minnesota have developed television courses for training new teachers with occupational experience but no professional training. Institutes, workshops, extension courses, summer programs, correspondence courses may be utilized. Some pre-service programs may be part-time courses given while the potential teacher is still employed in industry, a full-time program during the summer before teaching begins, or an internship type of a year or more duration.

Some studies of the role of the industrial education teacher and the tasks he performs have been made. Nichols[46] used a questionnaire to define the tasks performed by Ohio trade and industrial teachers for the development of study guides. Ullman and Ingersoll[47] studied Ohio trade and industrial teachers in an evaluation of instruction and learning. Data on background and experience of 331 teachers was obtained. The mean age was 44 with a range of 24-69; the mean years of work experience was 15 with a range of 0-44. The average teacher had about 2 1/2 years of college when he began teaching, but the range for years of schooling was from 11 to 19. Sixty percent at the time of the survey had no degree, 25 percent had a bachelors' degree, 14 percent a masters' and two teachers had a doctorate. The mean years of total teaching experience was 11 with a range of 0-45; the mean years of teaching experience in their trade area was 8.7 with a range of 0-40. One-third of the teachers worked an average of 17 hours per week on another job. The study found that local supervisor's ratings are significant indicators of quality learning situations, as the ratings correlated with tests of student achievement. Since supervisor's ratings were found valid, their ratings of teacher traitswere considered valid; the rank order of these as rated by supervisors was: knowledge of work, cooperation and dependability, public relations, practical judgement, ability to instruct and present ideas, overall performance rating, personality, school management, adaptability, and scholarship. An Opinion, Attitude and Interest Survey was designed to mearsure individual self perceptions of characteristics and behavior. Teacher personality, in terms of self-concept, was found to be an indicator of how students could achieve. The teachers possessed a driving force to succeed that was well above the average. This was evidenced by a high achiever personality score coupled with a somewhat lower intellectual quality score. The creative personality score was relatively low. The emotional and social adjustment scales suggested a stable group. The major expressed interest was in biological science, followed at a distance by physical science, business, social science, and the humanities.

Sutker[48] explored the roles and potentials for role conflict in a stratified sample of Oklahoma's secondary teachers--agricultural, trade and industrial, technical and distributive education. Data were collected from 250 teachers employed by 82 high schools on background, activity cognitions (what the teachers said they did in seventy different situations), normative expectations (the same list asking for what they feel they should do), and a satisfaction rating of 66 items. Teachers also asked to ascribe legitimacy to other groups they felt had a right to hold expectations of them. Administrators, counselors, nonvocational teachers, vocational students, nonvocational students, and parents were also asked to react to the list of activity cognitions and normative expectation as to what the vocational teacher did and should do. Role conflict might occur within the group or between groups. It was most apt to be serious if the other group was one to whom legitimacy had been ascribed. Instruments used and detailed statistical analysis for each of the four vocational categories are included in the report. Trade and industrial teachers had characteristics which set them apart from the other group. They were older, had less formal education (28 percent did not have a bachelor's degree), and had a greater number of years of nonteaching work experience. They ascribed legitimacy of expectations only to local school administrators and the state board. Vocational teachers are by no means a homogeneous group but differ among areas of specialization and also vary widely within each field. On almost all items there were disparities among the teachers themselves and all groups of evaluators. Parents showed the least disparity, both vocational and non-vocational students the most. On the whole, the teachers' perceptions of what they did were higher than the evaluator's. The wide disparity between perceptions of vocational students and teachers was serious enough to warrant further research. Distributive education teachers expressed the greatest satisfaction, technical teachers the least. Older teachers and those with more experience tended to be better satisfied. Trade and industrial teachers may have an added conflict between the academic orientation of the school system and expectations of work-oriented groups outside the school. The study shows a need for greater communication and understanding among vocational teachers and also a need to clarify their roles to others.

Barlow and Reinhart[49] completed a comprehensive study of California's 1,587 trade and technical teachers with full time credentials in community-junior colleges, high schools, correctional institutions, junior high schools, and skill centers. Approximately two-thirds were employed in community-junior colleges. High school teachers tend to be younger than community-junior college instructors, have much less work experience, teach predominantly in metropolitan areas, and begin teaching with less formal education. However, they report the greatest educational advancement while teaching. Tables, charts, and graphs present information on age, sex, subjects taught, marital status, organizational membership, and distribution by counties. Teachers' views on pre-service and in-service training and what constitutes good school environment are also presented. Over half of the teachers are in cities of 50,000 or more population, another 13 percent teach in suburbs, and about one-quarter teach in small towns. The type of school, particularly correctional institutions, is the most discriminating item in the study. Trade and technical teachers are older than most other groups of teachers (median age of 45.9 years), and they are older when they begin to teach (median age of 36.8 years). They have a median of 13.9 years of work experience prior to teaching. One-fourth have had 20 or more years, 43.2 percent 10 to 19 years, and 30.5 percent less than 10 years of work experience. The large number of recent entrants contributed to the smallness of the median (6.7) years of teaching experience; forty percent have taught less than 5 years and two-thirds less than 10 years. Ninety percent were teaching full time. Slightly over one-fifth of the teachers were still in the process of completing degree requirements. Improvement in formal education of those entering without a degree and higher formal education of new entrants has raised the standard considerably. Of the teachers included in the study, 21.9 had entered teaching with only a high school diploma, but in 1967 only 5.1 percent of this group were at this educational level. Most of these were accounted for by those in correctional institutions. In 1950, 59.9 percent of the teachers had no more than a high school diploma upon entry; in 1955-62 the figure was 38.7 percent, and by 1966 it had been reduced to 15.9 percent. The newer group tend to have both less work experience and more formal education upon entry into teaching. Trade and technical teachers are interested in professional organizations. The median number is 5.6 organizational memberships per teacher, and 98 percent belong to at least one organization. The elements of a good school environment were: philosophy of administration that supports vocational education, equal status with academic teachers, professional advancement related to trade and technical competence, adequate vocational counseling for all students, competent students, vocational orientation for all students, students who complete their training for a job, and adequate space.

Wenrich (See Vivian and Hoffman.)[50] summarizes the roles a trade and industrial teacher may have to play:

> an imparter of skills and knowledge, a creator of favorable learning environments, a counselor of youth and/or adults, a contributor to curriculum change, a coordinator who works with industry, and a placement officer who places and follows up his graduates and dropouts.[50]

Teacher education should prepare him for all these roles.

Barlow[49] in discussing the past and future teacher in trade and industrial education asserts the soundness of the principle of occupational experience, although interpretation of the concept may change to meet new conditions. The concept of the teacher as a master craftsman is still sound. To adjust to changing environment, today's teacher must not only be a master craftsman, but also a scientist and have an educational achievement parallel with other teachers. In teacher training the importance of the individual must be recognized. The program has been too content-oriented. It must be process-oriented, directed toward the motivation and active participation of the prospective teacher.[51]

What should industrial education teachers be expected to know? What competencies should they have? What do they do and what training is needed for the adequate performance of these tasks? The major study of teacher competencies was that undertaken by Walsh[52] in an evaluation of industrial teacher education. A list of 107 competencies was developed with the use of experts and rated by successful teachers, teacher educators, and state and local supervisors. It was found that trade and industrial education teachers need many distinctive skills and abilities in addition to those needed by academic teachers. There was a high degree of agreement in the ratings given by the three groups on the importance of the competencies. Those considered most important by all three groups were:

1. ability to develop student attitudes toward safe practices and safety consciousness in job performance

2. ability to demonstrate skills

3. a knowledge of methods of teaching shop subjects

4. an understanding of the objectives of Technical and Industrial

5. a knowledge of methods of teaching related subjects

6. ability to arrange questions in instructional order

7. ability to motivate students to acquire skill and knowledge.[52]

Supervisors and teacher educators were most dissatisfied with these competencies of recently trained teachers:

1. experience in developing instructional materials

2. preparation in testing and evaluation

3. orientation to total education program of the community

4. orientation to the types, locations, and services provided by community organizations concerned with industrial education.[52]

Competencies in areas of teaching methods and techniques were most often rated high. Schaefer[53] used Walsh's list of 107 competencies with a group of 30 local directors and 15 teacher educators to distinguish between usual and superior industrial education teachers. They were in fair agreement that knowledge of subject matter was the critical variable.

Some of the essential elements that form the basis for the development of a teacher-preparation program are listed by Muriel Ratner (See Arnold, Erickson and Suess.)[44] The prospective teacher should:

1. Have motivation to teach.

2. Know how and what to teach.

3. Understand the function, purposes, and philosophy of the kind of institution in which he will be teaching, and how that institution operates.

4. Know about the community by which the institution is surrounded.

5. Have knowledge and skill in developing a curriculum for his technical specialty.

6. Know the model socio-economic profile of students.

7. Understand the budgetary and financial resources of the institution.

8. Develop his technical curriculum through an interdisciplinary approach.

9. Understand his role and function as a faculty member.

10. Have knowledge and skills in developing testing and evaluative techniques and instruments.

11. Know how to use audio visual aids intelligently.[44]

Moeller[54] interviewed thirty-eight selected representatives of labor and industry for their views on programs of industrial teacher education. There should be well defined competency levels of preparation related to the levels in the areas they expect to teach. Work experience is essential for teaching manipulative skills. It is not necessary for the theoretical or "related instruction"[54] phases of an occupation. Cooperative work study is the best approach for more advanced levels of instruction. An understanding of the social aspects as well as the technical processes of industry is essential for all teachers of industrial education and is best achieved through a balanced program of academic study and work experience. Teachers must be competent in the professional aspects of teaching and should have as broad a background in liberal arts as other teachers.

California trade and technical teachers, as studied by Barlow and Reinhart[49], value their pre-service preparation, demonstrations by master teachers, practice teaching, emphasis on methods and techniques related to subject areas, help in lesson planning, and help in curriculum development. In the study made by Walsh[52] the three courses listed as contributing most to teacher success were: (a) trade analysis and course construction, (b) methods of teaching industrial subjects, and (c) development of instructional materials. Also rated high were practice teaching, observation of teaching, and visits to industry.

Tuckman and Schaefer[55] reviewed several studies evaluating teacher education programs from feedback given by graduates and supervisors. The teacher strengths and weaknesses are so obviously the result of the areas most emphasized and best taught in the institutions from which they graduated, that these studies are usually of value only to that particular institution. Some institutions emphasize technical competency while others emphasize teaching methods.

One area of teacher preparation that is open for argument is the amount and type of general education to be included in the program. This will differ with the institution degree requirements. Since for community-junior college teaching most teachers must continue through a master's degree and many secondary teachers will wish to continue, general education courses should be considered with relevance to usual requirements for entrance to graduate school as well to the fact that in graduate school there will be competition with students of broader backgrounds. Almost all programs include communications courses. Arnold in discussing the need for these says:

> Early in this century John Dewey made the point that increasing occupational specialization tended to divide people into smaller groups of progressively narrower and more completely different backgrounds, which were less likely and less able to communicate with one another. Common shared beliefs which are basic to the perpetuation of our democratic way of life were lacking. Hence, the problem of communication is not the exclusive learning of language skills and symbols, but rather is the development of background to permit and contribute to understanding and commonality of purpose among all people. Communication thus becomes fundamentally related to responsible citizenship.[44]

Arnold also suggests courses from the departments of sociology, economics, and political science should be taken if courses have special emphases, such as industrial sociology, business economics, and American government. Each decision as to courses might be related to technical teacher functions. Simon (See Arnold, Erickson and Suess.)[44]states that the teacher must have social and behavioral sciences with particular emphasis on the study of industrial and economic history, geography, industrial sociology, industrial education psychology, an understanding of labor and industrial relations, and political science. There is an emphasis in much of the recent literature on technical education (including English usually called communication), on the relating of all general education to the technician with training for academic faculty so that they will understand the technical program and slant their teaching accordingly. This may broaden the understanding and background of the academic faculty, but it does not provide for a broadening of the technician except in his own general area. It neither provides for an understanding of other disciplines nor for a common background for technical and other students. One of the problems arises from the fact that the amount of technical knowledge, science, and mathematics required for competence is so great that little time is free for unrelated learning experiences.

Erickson (See Arnold, Erickson, and Suess.)[44]suggests the professionalization of some of the technical coursework by using methodological approaches, instructional materials, and media that the student would be expected to use as a teacher, also continually weave in the rationale for the approach as the course progresses.

> Teachers tend to employ the methodology that they feel secure in using and security can usually be derived from first hand experience with a particular methodological approach.[44]

New methods, techniques, and media for instruction and their evaluation should be a part of the teacher education program. The use of these in the actual teaching of the student teacher with discussion of their value can be a part of the technical or the professional part of the program. Schueler and Lesser[56] suggested that through new media approaches the teacher educator can provide:

> more efficient observation of classroom behaviors; more efficient self-instruction and supervised practice experience; a direct means of presenting college-level teacher education courses; clearer, more commonly accepted and applicable standards of teacher performance; basic research in teaching-learning processes; and more efficient means of producing teacher competencies.[56]

Suess reviewed 22 studies illustrative of the "Snafu"[57] regarding teaching methods in industrial education. He summarized the experiments in programed learning, visual aids, demonstration methods, etc. with the results obtained by the experimenters but states that we cannot generalize from the research since the efficacy of different approaches is jointly a function of the approach and the type of students with whom it is to be used. Groups of learners have different characteristics. The students and the subject matter taught may be critical. Two studies of effective use of television are the report by Stout (See main bibliography.) which explained its use in an electronics technology program and that by Manchak[58] who found the use of magnification and close-up technique particularly valuable in industrial education. Foley[59] experimented with specially designed trainers in electronics fundamentals. Foley outlines procedures for designing performance aids: "identify the task elements; determine the functional characteristics of the aids; specify their physical design characteristics; evaluate, modify and up-date the aids."[59]

The April, 1968 issue of *School Shop* is devoted to the use of various media in industrial education and illustrated by a number of "case histories." Young and Beecraft (See Bell.)[60] suggest the use of audio-slide sequences for colleges with small budgets. Films of teachers in action are valuable for use in class directed observation and discussion, in presenting typical classroom problems, and in evaluations of student teacher performance. "Although the new media provide many tools which can be applied to the teacher education programs, the effectiveness of these tools has not yet been proven."[60] Schueler and Lesser also have a word of caution: "Media research is still too uncertain ...... to provide a sound basis for widespread application in practice."[56] Each teacher education program should study the various media and determine specific values in its program.

Texts for Professional Industrial Education Courses

Analysis of trade and industrial teacher education professional literature was presented in three reports at a conference in 1966.[51] Information was obtained from the head trade and industrial teacher educators, and bibliographies were assembled of textbooks and reference materials. In only a few instances were specific volumes identified as textbooks. Courses taught in trade and industrial teacher education vary widely in scope and content, variations usually deriving from two different ways of organizing the professional material. Some schools organize the material in omnibus courses covering all aspects of instructional procedures. Others organize the materials into specific courses, such as test construction, testing and evaluation construction, and use of instructional aids, teaching methods, and shop management. The wide range of approaches to teacher education makes it difficult for publishers to produce textbooks. Teacher educators who cannot find up-to-date texts covering the scope and content of their particular courses will assign readings in a variety of publications. The texts and reference materials obtained from the survey have been listed under headings descriptive of instructional areas with the list of teacher competencies to be developed in each area. Useful publications needing updating and areas for which suitable material is not available are also mentioned.

Student Teaching

Whether experience in the classroom is provided as the usual student teaching assignment or as some form of internship, this is the high point of professional training for the student. The supervisory teacher has more influence than the college instructor over the student teacher. Poleszak[61] reports from a sample of over 100 industrial arts education graduates. Industrial arts students reported the most satisfactory elements of student teaching were: teaching for a full semester in two different school situations, teaching their major, compatability with supervisor, and visits from college personnel at least every three weeks. (See Cappiello main bibliography.)

The use of micro-teaching which records the master or student teacher's performance has received attention lately and there have been a number of experiments with its use and with different types of equipment. Recording a master teacher permits a student group to observe and discuss the performance. Recording the student teacher's performance allows him to view his own performance. Student teachers have indicated the value of this procedure. It enables the supervisor to view and judge the performance and also provides material for class discussions. Stanford University has experimented with several methods of recording and has found video tape the most successful. This method has an added advantage since one man can operate the apparatus and its presence in the classroom is relatively unobtrusive. Allen and Young (See Center for Research and Leadership Development in Vocational and Technical Education.)[51] discussed Stanford's experiences in a number of pilot studies. The summer before intern teaching commences the student takes part in a micro-teaching clinic in which he gains experience before starting his teaching. The teachers learned from viewing themselves both alone and with their supervisors. Uses other than for student teaching are also being explored, such as its use in teacher employment and in remote supervision of employed teachers who want assistance.

Cohen,[62] in a proposal for the preparation of community-junior college teachers for academic or vocational programs differentiates among student teaching, clinical professor, and internship. Since what students learn is the test of teaching, all prospective teachers take a core course at the senior institution. Each prospective teacher builds a community-junior college course on specific objectives, why it is appropriate for community-junior college, and the type of students expected. It is a complete listing of the way actual learning will take place with specific, measurable objectives for specific tasks. Methods, instructional devices, and evaluative techniques are identified. The student teacher builds one complete course with the help of a community-junior college teacher under whom he will then teach and revise the course. In the clinical approach the student builds several units for different community-junior college courses and teaches them as designed under the guidance of a teacher. The student must submit evidence of learning to this teacher. Team teaching can be utilized with this approach which broadens the area of the student's teaching experience. In the internship program, the intern has obtained an actual paid teaching position and spends the summer before building all the courses he will teach. He rebuilds his courses while teaching and attends seminars in which problems are discussed. Supervision is remote, and he is responsible for finding his own way of teaching.

The trade-technical teacher education program in California was developed with relation to the background and needs of the students, the methods of employing teachers, and state certification requirements. It is a dynamic program changing to meet new developments.[51] The teachers were older and had at least three years of occupational experience; formal education was varied with some having degrees and some not; some had already begun teaching without professional education preparation. The teacher must develop in the areas of instructional assurance and personal actualization. The program is continuously analyzed; new methods are attempted, evaluated, and discussed by a teacher education program advisory committee. All the courses use the team teaching technique with the team planning their instruction in detail. Instructional material is multi-media including workbooks, notes, instructional sheets, audio tapes, programmed books, closed circuit T.V., and video tapes. Presentations are also made by specialists. No text is used, and instructional materials are being constantly developed. Teacher educators and students are continually evaluating the program and its parts, and feedback is obtained from supervisors under whom the teachers are teaching. Ten units of elective work required by the state are decided by the teacher, teacher education, and supervisor according to areas in which the teacher is weak. These can be taken at any state college or university. The teacher education program consists of two summer sessions and a school year of supervised teaching. This course is divided into three groups according to previous experience and activities are designed for the particular group. Observation, group meetings, meetings with master teachers and microteaching are used.

Wenrich (See Vivian and Hoffman)[50] in discussing industrial teacher preparation asks:

> Would it not be better to design programs of teacher education so that the development of

> occupational competence and professional qualification would occur simultaneously, or during alternating periods? The cooperative occupational training programs, operating in a number of institutions throughout the United States, attempt to combine both phases into a unified teacher education program; internship programs have some of the same features and potential advantages.[50]

There are some senior institutions that have put this cooperative plan into effect in their teacher education programs. Rutgers has recently initiated such a plan. Primarily aimed at vocational high school graduates in the upper three-fourths, it provides scholarships and permits them to attend University College in the late afternoon and evening while working at a day-time job which is restricted to one specific occupation. Each student will learn the practical aspects of a particular occupation, such as auto-mechanics, machinist, or electrician. Under traditional procedures, six years of work experience preceded the beginning of college work. This plan calls for 5,000 hours or about 30 months and the passing of an occupational examination. Six college credits are given for the work experience. Certification and a degree are awarded the student upon completion of the remainder of the college work. The last year is full-time study.

A number of community-junior colleges do have some type of related work experience or cooperative plan which enables the student to gain actual knowledge of the job while he is taking his technical courses. Some of these involve part-time work with part-time study; others alternate quarters or semesters with two students for each job (one working while the other is studying). As an example, Mohawk Valley Community College in New York uses this alternating plan in its technical courses with jobs related to course work and some noncredit assignments to do while working. Some arrangement should be made to allow such a student some credit for this work experience.

The University of Omaha's industrial teacher program which can be based on a two-year technical institute program requires 18 months work experience for the vocational certificate followed by a return to college for a degree or the student can take courses while he is working.

The teacher training plan approved in 1958 by the Illinois Board of Vocational Education required graduation from a two-year post-high school vocational-technical curriculum with transfer to the university's Industrial Education Department where the prospective teacher would take the general education and teacher training courses required of all secondary school teachers plus the required professional industrial courses. The student must also have two years of full-time related work experience arranged by the university either before or after his last two years of college work or in alternate quarters while attending college. Students receive credit for this work. Ramp[63] in outlining this program says that its basic idea is to enroll high school students with the expressed intent of developing them into industrial teachers, believing it more desirable to train a young person whose original occupational choice is vocational-industrial teaching. The work experience at Southern Illinois University is supervised by the trade and industrial coordinator who makes periodic visits to the student at work. The program and certification requirements can be completed in five years. One problem may arise because the student may prefer to stay in industry. Southern Illinois, therefore, requires the student to complete his work experience before completing his student teaching.

Industrial teacher education in the Partnership Vocational Education Project at Central Michigan University integrates both teaching and work experience as essential ingredients of its five-year program. The holder of the associate degree in a technical field from one of the cooperating community-junior colleges will spend one semester of his third year as a paid teaching aide in one of the cooperating high schools, one semester of his fourth year in an industrial internship in a cooperating industry followed by a summer employed in a job related closely to his field of technical specialization, and one semester of his fifth year as a paid teaching assistant in a cooperating school. The industrial internship with a partner industrial organization is designed to enable the prospective teacher to directly and personally experience the wholeness of the industrial enterprise. Either in a goods or service producing establishment, the intern has an opportunity to observe and take part in the full range of activities. The teacher preparation program combines the merits of the generalized industrial arts approach, which is concerned with studies unrelated to a particular field, and specialized vocational education. It begins with a year of interdepartmental studies for which instructors from major subject areas will organize the curriculum to emphasize the interrelationships of subjects and their relevance to vocational education. The University has revised its industrial arts curriculum to provide for special areas of concentration rather than general shop experiences. The teacher education program is part of an entire experimental vocational program involving high schools, community-junior colleges, and senior institutions in a horizontally and vertically articulated program.

Silvius (See Bell.)[60] has reported on a program at Wayne State University (Michigan) to identify a prospective teacher while he is still working in industry and, with the aid of a coordinator who visits him at his work, get him started on an individual college program while he is still employed. This has become primarily a post-journeyman or post-technician plan for becoming an occupational education teacher. Through study he will transform his technical skills into content that he will need to teach. He may elect from 4 to 54 quarter hours of college work in cooperative work study as part of his major, depending upon the character and nature of his industrial experience and the degree to which such credit will be of benefit to him. The amount and character of industrial experience must be validated prior to enrollment. The student may need some additional technical courses and some professional education work; he may work on an individual project that will be of value in organizing material for teaching. Emphasis is placed on helping the mature and experienced tradesman or technician relate his industrial experience to the development of needed materials for a teaching situation and to extend technical insights. This approach also makes it possible for the student to make the transition from industry to teaching with little loss in working time.

Gleazer (See Johnson) outlines the common elements in the preparation of community-junior college teachers recommended by the American Association of Junior Colleges to universities who train teachers:

(a) Teacher candidates drawn from diverse sources.

(b) Maximum participation by nearby junior colleges in the planning, conduct, and evaluation of the program effort.

(c) Supervised teaching internships in the junior colleges.

(d) Flexibility of student programming.

(e) University wide participation.

(f) Program content to develop teaching competence in two related subject fields.

(g) Program content related to the nature of the junior and community college, student characteristics, and guidance services.

(h) A master's degree in content fields for teachers of academic subjects; a bachelor's degree supported by relevant industrial or other experience for technology instructors.[64]

Community-junior colleges and senior institutions ought to join in a productive and creative partnership. Where there is an outstanding community-junior college, it can be used as a resource and demonstration center and its faculty can contribute much to the training of teachers. Harris[29] mentioned the problem of training community-junior college teachers (since most teacher training institutions put emphasis on elementary and secondary education); and the training of vocational teachers requires cooperation of the education department, the liberal arts departments, and the particular departments of their specialties.

Believing that both the community-junior college and the post-high occupational programs have characteristics and needs that demand teachers specifically trained in this area, the Junior College District of St. Louis and St. Louis County and Southern Illinois University are cooperating under a $500,000 grant from the Ford Foundation in a teacher education program. The emphasis in the community-junior college should be on teaching and it should be concerned with better approaches, methods, materials, systems, and their evaluation. There are several programs operating this pilot project:

> A short range program of a one semester internship in a St. Louis Junior College for those with master's degrees or those with

> bachelor's degree and extensive experience in a technical field to prepare them for immediate entry into teaching.
>
> A one year master's program for holders of bachelor's degree competent in an occupational field and with work experience.
>
> A one year master's degree program for bachelor's in academic areas to prepare them for teaching occupational students in a two-year post-high school institution.
>
> A three year program leading to a bachelor's and master's degree for associate degree holder in technical fields with some work experience. This program has more courses in the student's field.[65]

All programs include courses in the philosophy of community-junior colleges and the objectives of occupational education. The unique feature of all programs is a one semester internship under a master teacher in a St. Louis Junior College. The internship core is designed to be extremely flexible to meet the needs of individual participants and includes intern teaching, observation of master teachers in several fields, some actual experience for orientation purposes with student personnel, public relations and administrative services, individual case studies, field experiences, and a seminar for the discussion and interchange of ideas.

There are a variety of intern programs, usually at the graduate level and often for people with bachelor's degrees with no professional courses or teaching experience. The program at Temple University (Pennsylvania) is of this type and prepares for secondary or community-junior college teaching. It is a two-year program beginning in the summer before starting the internship in the fall. The educational content progresses from specific, such as what you are going to do on the job, to the general ending with the philosophy and sociology of education. Micro-teaching is used as part of the program.[44] Stanford University (California) also uses micro-teaching in an intern program in secondary schools. This is a twelve month program which begins in the summer with course study and a micro-teaching clinic. During the academic year, the intern teaches part-time while taking both academic and professional courses.

Michigan State University is developing a professional internship project to prepare teachers in vocational-technical education for persons who possess specialized competence needed at secondary and post-secondary levels and leading to either the bachelor's or master's degree. A clinical school coordinator and program advisors from each of the five vocational areas have been designated. Work has been done on developing and refining the clinical school and internship concepts and in formulating a program. Processes were developed for screening applicants, relating internship experiences with resident staff competencies designed, for establishing course credit, and arrangements for certification made with the State Department of Education. The Waterford Township School System and the Lansing Public Schools are being used as clinical sites in which to test the procedures (See Haines.)[66] Gleason and Davis[67] reported a conference concerned with internship programs for these people transferring from business or industry which discussed a definition of internship, selection of candidates, clinical setting, responsibilities of the university, certification, and measurement and evaluation.

Ontario's new program consisting of 19 post-high school colleges of applied arts and technology was established for commuters. They will not provide transfer or college parallel courses which will be provided by an expansion of the university system. Programs will be varied according to local needs, but they will be primarily occupational and remedial varying in lengths, day and evening, full-time and part-time including work experience programs. General cultural courses will be offered, and the college will also serve as a community resource center. The curriculum committee will consist of representatives of business and industry, the college, the university, and the high schools. College committees of students and faculty are proposed. Counseling will be important. Admission will be on the basis of ability for particular courses. Use of television, data processing, and research are planned. "A new concept of teacher education will be grounded in socioeconomic principles and on experience."[68] A two-year pre-service orientation period will be followed by two years of in-service training, the first year of which will combine education courses with teaching under a special counselor. The second year research will also be required. The teacher needs some broadening experience outside the subject. Since much of the staff in the skills courses will be recruited from business or industry, extension courses in the evening before employment should be given combined with seminars for in-service training. (See Davis.)[68]

Short Pre-Service and In-Service Programs

A short pre-service program followed by a pattern of in-service courses over a period of years is practiced by many states when hiring people from industry as instructors with no professional education and many without a bachelor's degree. The courses may be the responsibility of a local school system, a state agency, or a university. Some in-service courses may also be needed in which special aspects of the specific subject matter are stressed. These courses are also needed for teachers coming from other fields. Two types of in-service training are also needed to keep teachers up-to-date, both in professional education areas and in their special field.

Providing in-service education for vocational education teachers is one of the formidable problems facing vocational education in the future.

> Enrollment growth of vocational education, expansion in the numbers and occupations of groups to be served, and an environment of social, economic, and technological unrest and change all point to an imperative need for teacher upgrading in order that teachers may cope with the many new situations presented in the classroom, laboratory and shop.[4]

The council recommends that the responsibility for these programs be assigned to the state office of vocational education. The teachers studied by Garrison[69] and those studied by Barlow and Reinhart[49] preferred to have the senior institution responsible for these programs, and the industrial and technical teachers suggested coordination of industry and senior institution in courses related to the technical aspects of education. There is also need for some coordinated program of training for part-time teachers. An in-service training program should follow a constructive master plan and become a part of the regular effort of teacher education. Barlow and Reinhart[49] in their study of trade and technical teachers in California summarized what teachers wanted as follows:

> Workshops and seminars for specific subject areas should be provided.
>
> Latest information in the trade and technical fields should be disseminated.
>
> Industrial organizations and institutions of higher education should sponsor in-service training.
>
> Master teachers should be employed for in-service instruction.
>
> Sound methods of instruction should be taught and demonstrated.
>
> Training for vocational counseling should be provided for teachers and counselors.
>
> Central responsibility, direction, coordination, and communication for in-service training should be established.
>
> Credit should be provided on the salary schedules of school districts for in-service training.[49]

Teachers wanted to update knowledge and skills, learn about new equipment, and the latest trade and technical developments. The interest in vocational counseling seemed to have resulted from the fact that more vocational guidance is done by the teachers than by the counselors. Programs should be coordinated by teacher educators but should be planned with the aid of a representative committee of instructors for whom the program is intended. Preparation should be complete with resource material available and attention given to ways of teaching the new technical content. Some curriculums will need to draw teachers from a wide area, even the whole nation, in other fields they may be organized on a statewide basis or for an area of the state. Levitan[15] pointed out the great need for schools to equip their instructors to change curricula with new developments and changing demands for skills.

Many seminars and workshops are sponsored by industry, and obtaining employment in industry during the summer is another method of keeping in touch with new developments. The respondents in the Michigan survey by Silvius and Ford[14] felt that teachers should be allowed time for these activities, be provided funds for attending conferences, workshops, etc., and be given credit on the salary scale.

Salary increment credit should be given for the upgrading of subject material just as it is given for additional professional courses. Silvius and Ford[14] list companies which offer special programs for industrial education teachers. Industry and union groups will frequently pay the expenses of teachers attending special conventions and workshops. Silvius and Ford[14] recommended also that instructors be paid a salary while working without pay in a plant for purposes of professional growth, provided they submit a report of the experience; but, should they be employed for twelve months with two months spent working in industry or in other programs? The Dunwoody Industrial Institute has had a plan for professional growth operating successfully for fifteen years (See Butler.)[70]. All members are hired on a twelve month basis with a month's vacation. The rest of the summer is used for staff improvement and program development activities. This is arranged by the director, the department head, and the instructor. He may attend a university program or a course arranged by industry (credit or non-credit). If it is out of town, he is given an expense allowance. Employment may be arranged to upgrade his knowledge or competence. He must submit a written report of his experience. He may not be paid, but his school salary continues. Other staff members spend this period at the school on curriculum development, preparing instructional devices, repairing equipment, etc. The plan is a rotating one on a three-year basis for each instructor with school one year, work the next, and then program development. Other arrangements are also made for special opportunities that occur throughout the year. Schools should invest in the training and development of their personnel. Instructors are the key men.

Another part of the Dunwoody Plan might be adapted to a senior institution/ community-junior college arrangement. This is an interchange whereby Dunwoody instructors may take professional courses at the senior institution and students from the senior institution industrial education division may attend Dunwoody shop and laboratory courses without fees.

Ohio programs for those coming into teaching from industry as explained by Reese (See Center for Leadership and Research Development in Vocational and Technical Education.)[51] consist of a one-week, pre-service workshop which is a basic orientation program followed by four years of an in-service program meeting one-half day every two weeks. The supervisor has the responsibility for determining the material in line with what the teacher needs. Observation is also a part of this. After this, the teacher, for further certification, must complete eighteen additional hours of college work.

Television courses are being used in North Carolina and Minnesota for in-service and initial pre-service teacher education in order to reach teachers too remote from extension centers. The course entitled, "Introduction to Industrial Education in North Carolina" is described by Hanson, and Nelson discusses its use in Minnesota (See Center for Research and Leadership Development in Vocational and Technical Education)[51]. Minnesota also uses television for recruiting teachers.

Brown[71] described in-service education in Arizona which includes pre-teaching orientation, instructional improvement, half-days, college extension courses, and summer workshops. Northern Arizona University has extended its program of inviting occupationally qualified persons to attend professional teacher courses to qualify for positions as trade and industrial teachers. In Kansas, teacher educators teach extension courses in eleven cities in a pre-service and in-service program for industrial education teachers. Courses are also given during the summer. A trade competency examination is required. Kentucky used a series of regional conferences for in-service training.

The University of Tennessee in cooperation with the Oak Ridge Associated Universities and the government's huge Oak Ridge Y-12 Plant operated by Union Carbide is developing summer credit programs for secondary and post-secondary teachers in mechanical and industrial electronics technology, machine shop, and fabrication. It is a combination of course work in the University of Tennessee's Industrial Education Department and technical work using the facilities and instructors at the Oak

Ridge Plant. During the school year, the program is open to instructors who are near completion of a bachelor's or master's degree. It will provide opportunity for updating in both teaching content and techniques. (See Center for Research and Leadership Development in Vocational and Technical Education[51] and Merrill and Russel[72])

Two, six week summer workshops for community-junior college teachers are given for training in interdisciplinary team approach. A program coordinator from the community-junior college will work with teachers in the surrounding high schools in developing the team approach. The program is being developed under a Ford Foundation Grant by an integrated professional staff working with an advisory committee of leading educators in Mississippi. It includes workshops and in-service training, community-junior college faculty exchange with the senior institution faculty, and new degree programs which prepare future teachers. It also provides for planning long-range programs to strengthen vocational-technical courses in the community-junior colleges, development of admission standards geared to special needs of educationally deprived students, and establishment of supporting programs in the high schools.

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Articulation of Courses and Curricula for Industrial Teacher Preparation

Articulation of courses and programs and the cooperative action among groups involved is a dynamic process that requires constant attention and continuing labor. In the articulation of courses and curricula in industrial education, a number of people, institutions, and agencies are involved. These are not necessarily all involved to the same extent, at the same time, nor on the same matters.

If the transfer of students is to be facilitated, good communication is needed between the institutions involved as well as a knowledge of what is being taught and how well it is being taught. Agreements should be communicated in writing to advisors, counselors, admissions officers, registrars, faculty, and anyone else concerned. When junior college students have to make up high school deficiencies, the senior institution should specify whether these deficiencies must be made up before applying for transfer and whether make-up courses will be awarded transfer credit. A transfer student should not be penalized because of changes but should have an option of meeting new requirements or those in effect when he enrolled as a freshman. Junior colleges and senior institutions should notify each other of proposed changes as soon as possible.

Faculty and administration from both junior colleges and senior institutions must understand each other's objectives and the actual content of specific courses, both general and technical. Junior college and senior institution counselors must understand the program and the courses as well as the requirements of the senior institution. Admissions officers or registrars are involved and should have agreements with the departments as to what can be automatically accepted for transfer credit, what may need to be validated by examination, and what should be decided on an individual basis. Departments offering the general studies in both types of institutions may also be involved in working out agreements. Requirements for graduation from the senior institution need consideration, and as far as possible some study should be made of what requirements are usual for entrance to a number of graduate schools in case the student may wish to continue with advanced work. The State Department of Education and of Vocational Education should be consulted on certification requirements.

A senior institution may be responsible for working out an understanding with the junior colleges in its area, but where there are a number of senior institutions in the state to which the student may transfer with differences in their requirements and the programs they offer, studies needed to be made of the total state picture.

High School-Junior College Articulation

A thorough study and revision of curricula seems to have been necessary in cases where horizontal and vertical articulation between courses and between levels has been achieved. This involves faculty, counselors, administration, state department personnel, and business or industry. Three examples of articulation at the high school-junior college level will illustrate the number of personnel and the amount of work involved in the process.

Example #1. The first is the account of a conference in New York State at the beginning of such a process. It did no more than identify the problems. Brick[1] describes the procedures involved in planning articulation between high schools and junior colleges in business, electrical, and mechanical programs:

> A conference was called of representatives of the State University of New York, the State Department of Education, the Center for Urban Education, the American Technical Education Society, the universities, the two-year colleges, and high schools.
>
> It was found that the two-year colleges differed in their course contents and in the amount of high school mathematics required and in general admission standards, but all agreed that their students were average or below. The entry jobs for which the programs prepared students also varied widely. They recommended that high school preparation in science and mathematics be improved and that both shop and drafting in high school needed changes.

Better preparation in English was also stressed by junior colleges. In all areas too much time was spent on remedial work. Some stated that students of engineering calibar were needed but that high school technical programs were "dumping grounds." Electronic technology programs had mathematics and science requirements, students were described as average, and most entered junior college from an academic program.

High schools stated that students in vocationally oriented programs do not attend junior colleges, those in technically oriented programs enter engineering schools, and that junior college programs tend to duplicate high school programs. High schools complained about unrealistic entrance requirements, particularly in the business courses, and lack of reporting follow-up information on their students. High schools also complained that the only articulation was a one-day visit to the junior college in the spring. Neither knew what the other was doing. Suggestions included joint advisory committees, joint summer workshops for teachers, and joint curriculum committees in each technical field. Problems to be answered concerned the type of student for each program level and when the student should enter preparation for a specific occupation.

In New York, high school programs have not been planned for students to continue their education at two-year colleges, and two-year colleges have generally offered only the high-level technical programs and there have not been programs for low ability students. The purpose of the junior college in New York is now changing to greater comprehensiveness that will include vocational training on a crafts level. Guidance programs at both levels need improvement and need to work together. Junior college faculty need greater understanding of the high school and of the nature of the typical student in an open door institution. Mathematics and science in the high schools have become too theoretical, widening the gap between those going to college and those who cannot handle this material. Those going on to junior college technical courses need a different kind of science and mathematics. The two-year college will have to make clear what is needed in these areas. Study of the typical two-year electronics program showed that it was on too high a level for the average student and the attrition rate was high. Actually not more than ten percent of the electronics technicians need to be on this level. This program actually should be offered as the lower division of a B.S. in technology. For the other 90 percent of technician jobs the level of the electronics program should be lowered. This is the program with which the comprehensive junior college needs to be concerned. The only entrance requirement would be high school algebra.

Model programs should be developed for articulation between high school and junior college and junior college and university for each region of the state. Expand the pre-technical program at the high school level; use tests to provide advanced placement in junior college to avoid duplication. Follow-up studies should be provided the lower institution, should be specific about students, and should reach the entire faculty. Articulated technical programs for grades 10-14 should be developed.

Example #2. Project Accent (See Chandler.)[2] is a cooperative venture of San Bernardino Valley College and ten surrounding high schools in developing counseling and instruction from grades 11-14 to reduce the high attrition rates in auto mechanics, applied electronics, and office occupations training:

This project attempts to identify and advise the student in high school and give him a coordinated high school-college program. Efforts to improve the image of the vocational courses are being made through field trips, contests, publicity, buddy-day participation, brochures, handouts, etc. The situation did not call for an outside expert and an advisory committee but for detailed work by teachers and counselors, coordination by an experienced executive, and cooperation by the administrations of all the schools. The coordinator was to have his office at the college and to work full-time on a twelve-month basis. The committees needed were planned, and duties and responsibilities for staff and committees specified. "Improvement...is more likely to come by giving local counselors and vocational educators the assignment, the practical experience, the resources, and the authority to study their resources and to engineer fully rational programs."[2] Staff with committee responsibilities were given adequate time from other duties.

The curriculum was to be worked out by one supervisor from the college in each of the three occupational fields visiting with selected teachers from the high schools. Job descriptions and worker requirements for each type and level of job in the occupation would be drawn up and the curriculum designed to provide for job entry skills and knowledge for each job as well as optimal progression. An area wide advisory committee would help in working out specific job requirements.

A workshop for counselors was set up to expose counselors to real job experiences, to provide visits to job sites and training facilities, and visits to vocational schools. Most counselors are college oriented with little vocational knowledge. They started by visiting facilities in their own schools, in other high schools, and at the college. The program aims at broadening the fields in which counselors are given experience and information. The continuing workshop the second year added more industries and jobs.

The counselors took an active part in the development of material needed for guidance. A counselor from the college was to meet regularly with one counselor from each high school to work on the identification of students most adapted to the program, on ways of interesting students and parents in other than academic programs, and to develop adequate and exact information for counselors about each job in the occupational fields and also to transmit to counselors all information on latest high school and college programs available.

The public information work group consisted of a supervisor from the college in each area and counselors, advisors, and teachers from each of the high schools. It worked on methods of publicity and upgrading the image of the vocational programs and on the production of material needed to give counselors, teachers, students, parents, and employers adequate information on vocations and training programs. A survey of available job information showed that too often brochures are the glamour type, films often out-of-date or unrealistic, and much of it was not related to the local area and its jobs.

The plan is to use locally produced video-sonic packages of 35mm slides and audio-tape giving exact information on jobs in the area, pictures from local industries, experience stories of local workers, voices of students, counselors, and graduates. These can be different for each high school and can be easily updated. They will guide the student step by step through training programs to various job levels.

In a survey of facilities, it was determined that for the area they were sufficient and should not be duplicated by a high school lacking needed ones. Students should be sent to those already existent.[4]

Example #3. Another plan for articulation of high school courses with programs of a new community college is reported from Clackamas County in Oregon (Mikalson)[3]:

Planning was needed to determine need for and relevancy of high school courses already offered to eliminate overlapping and gaps and to stabilize course content. Administrators, vocational directors, and counselors from the high schools; college personnel, the State Department of Education, the college advisory committee, the Oregon Apprenticeship Council, and the State Employment Service all cooperated in the study. Implementation of the cluster concept is the guiding principle in Oregon's vocational education planning.

> Changing occupations and totally new occupations require constant restructuring of occupational education to prepare our students for employment. Knowledge and skills required for performance on a particular job today may be considerably changed a year from now due to technological change. To prepare a student for a particular occupation today from junior high through secondary school and community college involves consideration for change. Provision for adjustment to change in occupational demands must be built into occupational education curriculums. Education and training for families of jobs in occupational clusters will more adequately provide for this change. General background information and skill training common to

> a group of occupations will alow for changing job demands.[3]

Previous studies and occupation information from the Employment Service for the Greater Portland Area provided current data and future predictions. Job clusters for which education and training are needed were identified for the area. The State's Division of Vocational Education and Community Colleges has grouped jobs into clusters which have common basic information and skills, and listed educational programs for these clusters. In articulation with junior colleges, the more specialized programs should be given in the junior college but should be built on a high school preparatory program with special attention to the science and mathematics needed. Courses basic to several programs must be identified. There should be some duplication of courses to enable a student to begin career preparation in junior college. The length of the course should be determined by its aims and content. Study of the high school courses including those proposed related the offerings to job needs and showed the areas in which programs are lacking or poor. On-the-job training programs in the area are limited and poorly planned.

Recommendations of this study were for workshops of high school teachers, counselors, and college personnel in each occupational cluster to work out curricula and articulation procedures, to standardize course content, to make sure high school courses include content necessary for junior college programs, to compare offerings with area employment needs, and to determine at what level certain courses should be given. Costly facilities should not be duplicated. College and high schools should share some facilities, students should be sent to the school with the facilities for the program he wants. Counselor workshops need to work on exploratory courses and the use of these in guidance, on better career guidance and program planning for the students' progress through high school andjunior college.

Other Examples. There are numerous other examples of high school-junior college articulation plans --the Richmond Plan involving Cogswell Polytechnic Institute[5] and cooperating high schools; Project Feast, the pilot study now in progress at Western Washington State

College,[15] etc. All of these have involved administration, faculty, and counselors from both levels and the cooperation of industry in an overhaul of the curricula. Cooperation between disciplines has also been necessary to achieve horizontal articulation. The comprehensive curriculum in the graphic arts being developed at Western Washington involves teachers and administrators and industry representatives working with the State College in developing and refining the curriculum. It involves a two-year high school program with options in the senior year for those planning to enter industry and those planning to attend a post-secondary program which will prepare students for technicians' jobs. The college will offer a training program for teachers of these courses. Providing for training or retraining of teachers and counselors as well as curriculum revision has been an essential part of all these projects.

High School-Junior College-Senior College Articulation

The Partnership Vocational Education Project, under a Ford Foundation grant is an example of cooperative planning for articulation both between high schools and junior colleges and between junior and senior college levels. It attempts to articulate education between levels and among disciplines. It involves the cooperation of many people and organizations, including business, industry, local chambers of commerce, and similar associations. Coordination of counseling and guidance services is a part of the project.

Through cooperation of Central Michigan University with fourteen public school systems and three community colleges, flexibility is provided that permits job entry at several levels or continuance through college and allowing for transference within the program. At the senior level students may enter teacher education or further work for industrial employment. The high school program begins in the tenth grade with a relatively broad approach to the study of American industry, with opportunities for exploration and attaining an understanding of vocational opportunities and the required preparation needed for various occupations. The eleventh and twelfth grade is a two-year sequence of courses in English, science, mathematics, and industrial-technical education. Students acquire both enough preparation to enable them to enter the labor force upon graduation and enough credits in college preparatory work for admission to enter Central Michigan's liberal arts or industrial program.

The high school program accommodates three levels of students. The first group are those with college ability and interest who may be recruits for teaching or for careers in technology or applied sciences. Intermediate level students may want to enter the labor force or continue at the community college. The third level consists of those students who are probably not capable of college success. Shifts between these three levels are possible. It is expected that most of the community college students will aim at an associate degree, but transfer to the university is possible. The program is designed to provide proficiency in a chosen field augmented with other subjects correlated through interdisciplinary planning.

A brief general summary of cooperative projects of several types among colleges and universities is a government publication by Martoran, Messersmith and Nelson.[11]

Small College Articulation Problems

The problems of small junior colleges must be understood also in planning teacher education programs that are based on a junior college vocational program since more than half of the junior colleges in the country have fewer than 1,000 students. Seitz[7] gives a good presentation of the problems:

Training technicians in a small community college has to relate more to feasibility than to desirability. Local needs and interests can be readily determined, but the ability of the college to produce the quality of technicians needed is the problem. Success of graduates determines value of programs. Quality may be dependent not only on available funds, but on problems of enrollment and staff. The college, although small, may have to serve a diversified area. Furthermore, many junior colleges are relatively new.

About two-thirds of students on the whole select a transfer program and attrition rate is about one-half. When technical programs are introduced in a previously academic college, they are chosen by one in every twelve, but the enrollment will usually double the second year. The students often select the program on the basis of interest or peer interest rather than their ability or sound counseling. Evening technical courses are usually better attended than day courses.

The location of the college, the composition of the district, and the general concept of inadequacy often associated with small colleges are related to problems of funding, staffing, and enrollment. While federal and state funds may be available, the small institution is still not as financially able as the large one and can usually support only one or two technical programs adequately. Good part-time teachers may not be available in the small community and for good full-time teachers the small college must compete with those in larger communities where salary, prestige, housing and community opportunities are better.

Both quality and quantity of students for program are important. Are there enough able students to do the quality of work required? How many will continue until the second year? Is there staff and equipment to handle the expected number? Other factors which affect the enrollment are transferability of credits, counseling, the attitude of the local people, publicity that can be obtained, and the image of the college.

Local conditions as well as total enrollment must be considered in deciding whether the college is large enough to support the contemplated program. The author illustrates the problems by description of the experience at Mineral Area College which had existed as a transfer institution for many years when it introduced two associate degree programs, one in civil and design and drafting technologies, one in business and office practice. A limited number enrolled the first year, sixty percent dropped out leaving an inadequate number of sophomores, but there were twice as many freshman in the second year, many with limited abilities who had to be redirected. Regardless of community needs the community college should offer one program such as electronics or drafting that has appeal to the high school graduate. Thought should also be given to the transfer of credits in the program.

The small college does have the opportunity to be innovative in its instructional program. In technology courses there should be emphasis on inquiry, problem solving, critical thinking, and inventiveness. The process goals should have more attention than the content goals. At Mineral Area College the first level of instruction is didactic and students are expected to follow the instructor carefully; at the second level the student has experiments to perform and problems to solve; at the third level the student is asked to work on new ideas or problems to which the answer is not known. His successes at these three levels are important to his future career.

Problems of community colleges in rural areas or in areas of sparse population are receiving some attention. In Iowa and Arizona a student may attend any college so that some colleges can offer one or two occupational programs and draw from the whole state. Washington is considering area residential schools to offer vocational programs for all schools in the area and the use of televised courses for providing related information for apprentices who will be working in their locality but where the number will be too small to provide courses at the community college. A National Advisory Committee on Occupational Education in Rural Junior Colleges has recently been established to aid these schools in establishing and developing occupational programs.

Rapid change and increasing costs have brought almost insurmountable problems of providing staff and facilities adequate to the education of today's vocational teacher for some small colleges that have traditionally trained teachers. This is particularly true of the small Negro colleges in the South (See Bell).[2] The small or inadequately financed senior institution may lack programs to meet those offered in junior colleges. It may not be able to attract or hold or even have funds to hire adequately prepared staff. Some of its equipment may be obsolete, and it may be unable to offer facilities necessary for the adequate occupational training of its prospective teachers.

There are some possible solutions for these problems. The Advisory Council on Vocational Education has suggested two or three states combine in supporting one teacher education institution for the whole area. Another solution may be in agreements among several institutions to each specialize in particular occupational programs, as has been done for a number of years in the field of area studies. The student enrolls and pays tuition in his own school and then may be sent to another state for the courses he needs. Shared use of faculty and facilities may be worked out by several colleges within the same area, as has been done by the University of Massachusetts and other schools in its area. Again the student is enrolled in only the one college but takes courses at one of the others. Another solution used by a number of junior and senior colleges is that of contracting with a nearby industry to provide facilities and staff for an occupational program. The cooperative program of the University of Tennessee and the Oak Ridge Y-12 plant is an example of this type of solution.

Guidelines

The Joint Committee on Junior and Senior Colleges[9] established a set of general guidelines for facilitating transfer from junior to senior college as a result of Knoell and Medsker's[9] national study of the transfer student and a series of state conferences in the ten states which participated in the study. While these guidelines may not be applicable to all situations and may require local and institutional modifications appropriate to particular situations, the committee hopes that they may stimulate thought and consideration for the transfer student.

> The major purpose of the Guidelines is to provide a framework within which junior and senior colleges, singly and cooperatively, can develop specific policies governing transfer between and among institutions. The Guidelines are not intended to be a substitute for local and state policies, but instead, a set of principles against which the appropriateness of particular policies can be tested. If the Guidelines are effective in accomplishing this purpose,

> a situation will be attained in each state whereby students will be able to move through transfer programs with a minimum loss of time and disruption of study. At the same time, individual junior and senior colleges will have a reasonable degree of autonomy in matters of curriculum and standards.
>
> If the guidelines are to be effective, an attitude of mutual respect and cooperation is very urgently needed. Articulation, representing the needs and interests of the individual student and his professors, and coordination, representing the interests of society and the state, should be carried on in an atmosphere of interdependence among institutions having common concerns in higher education.[7]

In addition, the Guidelines state that, "An annual review of courses should be made at the time catalogue copy is prepared or when new courses are developed for which students will expect to receive transfer credit."[7] This brings up one of the problems in transfer which is also equally applicable to the transfer of credit between senior colleges. It is impossible for a junior college to offer the many diverse courses required by all the institutions to which its students may transfer. Junior colleges usually offer broad survey courses, in the humanities or the social sciences which may not be acceptable as being equivalent to lower division requirements of some senior institutions. In facilitating the transfer of the industrial education student, consideration must be given to the acceptance of the general courses he has had in junior college. Where the senior college is not sure of the quality of these courses, examinations can be given to determine the students' placement.

Transfer Problems

In attempting to make general subjects more relevant to the technical student's major interest, many junior colleges give communications courses specifically for these students that combine speech, graphics, and technical writing. Some senior institutions do not accept these courses as equivalent to the freshman English requirement. Some students stated that even when given the opportunity to waive the freshman English requirement by examination, their junior college course had not been good enough to enable them to pass it. They suggested that junior colleges should have copies of these examinations to make sure the communications courses were of a satisfactory level.

Another problem area in the articulation of courses is that of science and mathematics. The content and how they were taught in the junior college may be important. Were they general courses taught for all students, were they too theoretical, were they engineering oriented, or were they directly applicable to the student's technical area and correlated with his technical courses? If he needs more science and mathematics, does the senior institution offer these courses as they relate to the technical knowledge he must have for what he wants to teach and will they provide him with the applied knowledge he needs for secondary or post-secondary teaching? These questions are posed as a result of casual conversations with students and teachers over the problems they have had with science and mathematics. Students mentioned that in technical or mathematics courses in which they had a "C" grade, the "C" may have been given because they tried hard or because their grades on specific tests or units averaged a "C" although they had some "D's" and "F's" during the course. This lack of necessary knowledge of some specific things caused trouble in more advanced courses and the students indicated they wished there was some way they could obtain special help on specific problems. Perhaps some type of programmed learning would be of help here.

In the articulation of vocational courses between educational levels as well as between school and industry, one of the difficulties is that of determining course content. Alden[1] states that the greatest growth in two-year institutions seems to be in industrial technician curricula of a level not eligible to be accredited by ECPD. These industrial courses represent a "highly variable set of programs with little or no standardization of course content, quality or nomenclature whose impact could create a great deal of confusion among students, employers and recruiters in the next few years".[1] If, as in Florida in liberal arts, any holder of an associate degree in a technical field is to be admitted to full upper division standing, examinations in the technical specialty, mathematics or science may be necessary to determine placement. If the student does not have an associate degree but desires to transfer junior college technical courses, examinations may be necessary to determine both placement and amount of credit to be allowed.

Course Equivalency Lists

Course outlines and names of texts and references used may be helpful in facilitating transfers to the senior institution, but the teacher may not have followed the outline. The background, ability, and needs of his students may have been such that he had to make changes to fit the needs of his class. (Dauwalder[12] found it almost impossible to compare curricula and courses of various schools from catalogs or course description or to determine from these what is actually being learned.)

After comparison of actual content, objectives and evaluation of what the student can be expected to know upon completion of a course which includes knowing what a "C" grade in the junior college course may mean, a master list might be made up of all similar junior and lower division technical and general courses in the state. Dauwalder recommends..."that schools at all levels coordinate their titles, descriptions, and course content more completely in order that degrees, diplomas or certificates which are issued will be more meaningful to the employes."[12]

A uniform numbering system with uniform course descriptions, such as the State of Washington has for liberal arts transfer courses, would make life simpler. Courses for which there is no equivalent in the senior institution but which are acceptable in lieu of some other course toward meeting specific requirements as well as courses which will be accepted as elective credit toward a degree should also be included on this list. Once such a master list has been established and agreed to, it must be kept up to date. It must not be a bar to flexibility, experimentation, or the autonomy of any institution, but a guide to what has already been agreed upon.

Proportion of General, Technical, and Professional Education

What proportion of general education, technical education, and professional education should be done at the community-junior college? To some extent this might depend on the individual student and what he wants to do, or on what the junior college can offer, or on the offerings of the senior college. In line with the recommendation of Knoell and Medsker (1965)[9], he should complete all lower division work before he transfers, even if this means staying longer in the junior college because he had to take some remedial courses. They found that the student who had completed all lower division work before transfer had a greater chance for success. Students tended to find lower division required courses stumbling blocks when taken in senior college. The Criteria for Technician Education (U.S. Department of Health, Education and Welfare)[14] recommends that a student, even if he needs remedial courses in science and mathematics, commence some courses in his special field his first semester in junior college. This is his main interest and if he is delayed, he may lose interest and drop out.

Some junior colleges have a great diversity of technical courses of good quality. Where the junior college is small or where it does not offer what the student wants, he may have to defer some part of his technical program until he reaches senior college. If the junior college is close to a senior institution which offers what he needs, he may be able to take a course there while still enrolled in junior college. The junior college may have a diversified program with occupational courses not offered at the senior institution. When these courses are relevant to his goals as a teacher, the student might be permitted to offer these credits toward his degree as an elective or as a minor.

The junior college program is a full one for the technical student and does not normally offer a professional education course related to the needs of the vocational teacher. Suggestions from students, however, were that there should be some sort of very interesting and very practical education course. It would serve both to keep the interest in teaching of those already committed and interest other junior college students.

Suggestions were that it should be a sort of laboratory and discussion class learning about and constructing instructional aids that would actually be used in classes, discussing their value in teaching, learning about the care of equipment, setting up laboratory experiments, etc. They thought teachers from the university should make frequent visits to the class, give talks and hold discussions, and definitely show an interest in the students as individuals.

In a way, their request that such a course be both specific and action involved was related to the comments of a few teachers who said that they almost threw up the whole idea of teaching after their first couple of education courses which were boring, a matter of menorizing a lot of vague material, and seemed to have no relation to life. They thought early contact with students, some concrete material, and more specific action things should come at the beginning of the professional courses. The more general courses, such as the philosophy and history of vocational education would have much more meaning at the end of the program.

Normally, students should be able to complete the industrial teacher education program as now set up in four years except in those universities with five year programs which include a year of related work experience. Such schools include Southern Illinois University, University of Omaha, and Central Michigan University. By selecting the senior institution program early, students can more easily arrange schedules which will enable them to complete all the lower division requirements in the junior college. If such planning is not accomplished, "the need for flexibility and cooperation increases markedly".[14] The Guidelines state that:

> a) Faculty members in the junior and senior colleges should all work together for the good of the student; for example, to identify common curriculum concerns and experiences which may be built into their respective programs.
>
> b) Flexibility in curriculum matters should be strongly encouraged so that students who have

been diverted to the institutions of their second or third choice will not be delayed by differing requirements in completing their degree programs.

c) Junior and senior colleges should be encouraged to experiment in matters of instructional method and content. However, transfer students should not be penalized by such experimentation through loss of time and/or credit.[7]

The conclusion regarding articulation, as the Guidelines emphasize, is that the welfare of the student should be the prime consideration. Therefore, many of the problems regarding transfer are going to have to be decided on an individual basis.

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Staff and Facilities

Vocational-Industrial and/or Technical Deans

In describing the type of person to be selected as a community-junior college president (with reference to a college small enough for the president to have direct supervision of the teaching staff), O'Connell says the first consideration should be: "Would you like to teach under him?"[1] This is also a good question to ask concerning a dean of vocational-industrial and/or technical studies in a community-junior college.

If the community-junior college is to be comprehensive, there must be provision for a dean or vice president who has authority and top status in charge of occupational education. F. Parker Wilber, president of Los Angeles Trade-Technical College (See Richardson.)[2] says that the dean must understand the needs of the area, decide what program should be promoted, with whose cooperation and how to coordinate the various programs, and how to keep abreast of changing needs. If the college is a large one, a head is also needed for each occupational area, and there must be a coordinator for evening programs.

The following doctoral dissertations centered on the role of the chief administrator of vocational-technical education in public community-junior colleges in the nation. Whitney[3] reported that, of 371 responses, six percent were first level administrators, 45 percent second level, 44 percent third level, and five percent fourth level. Three-fourths were full-time and the majority were employed on contract. Seventy-six percent had previous occupational experience predominantly in skilled crafts, business or industrial management, and engineering. There were 121 administrative duties identified, with major responsibilities in the areas of general administration supervision and relatively routine business activities. Eight administrative organizational patterns were identified ranging from those in which the administrator was the president to those in which he was a coordinator with only staff authority. In most colleges the administrator reported directly to the president and had parallel status with the director of the academic program. Standard preparation was a master's degree in educational administration, vocational-technical education, or industrial education. Administrators worked under 137 different titles, but preferred the title of dean.

Gates[4] found no Ph.D.'s in his group of 66 administrators from 50 community-junior colleges. Most of them took academic courses in high school, had a B.S. degree with a major in industrial arts or industrial education and a master's degree in education. The typical administrator was responsible to the president, supervised 16 or more faculty, and had other non-teaching duties. He served on the academic council and the curriculum committee. Gates analyzed the types of 480 occupational curriculums found in the colleges as supervised by the administrator and could find no evidence of an association between the scope of the technical program he administered and his undergraduate or graduate major, highest degree earned, course work in the community-junior college, course work in technical education, type of teaching experience, number of years of teaching experience, type or length of administrative experience, professional and non-professional experience, or technical education philosophy.

No studies were found on the influence of the orientation of the dean in the community-junior college vocational-technical program on the orientation of the staff, the emphasis in the program, or on the level of instruction. A background in industrial arts or industrial education may mean a lower level of content or instruction in the course offerings with more emphasis on skill training, not so much mathematics and science required, and selection of staff to meet these requirements. These courses may be better suited to the needs of particular students than more rigorous high-level technical courses. Since the word technician sounds as though it is of a higher status and a two-year technician course implies greater prestige, there is a tendency for community-junior colleges to apply this label indiscriminately. (The industrial arts background of much of Kentucky's senior institution staffs has probably had some influence on solving the problem of staffing new area schools by upgrading industrial arts personnel.) In New York, the bias toward higher level technical programs has not met the needs of a large group of students. (Knoell)[5] The criteria for technician education of the U.S. Department of Health, Education, and Welfare, considering the high-level of these programs, demands an engineering background for the head. However, without any sound research studies, no conclusions can be drawn.

The characteristics and abilities of a department head in a post-secondary technical program are described in these same criteria as:

> technically competent in all phases of the technology, able to plan and equip the facilities, capable of developing and initiating the details of the curriculum, able to provide the necessary leadership in student selection and graduate placement, and qualified to develop the coordinative departmental teaching effort which will develop completeness and excellence in the program. He should work with the local advisory committee for his program, and in other ways lead the program with the support of the school administration.[6]

A department head in a post-secondary school may serve as industry coordinator. Such a head, Burt[7] states, should have both teaching and industrial experience. He is responsible for both formal and informal contacts with industry and the community, for helping and supervising instructors, for selection of teachers, and for evaluating curricula and methods. He should be aware of changes in industry and be responsible for keeping his staff up-to-date. He works with the occupational committee. He also may coordinate work programs for students and assist in placement. As an illustration of the coordinator in action, Burt describes the operation at the Los Angeles Trade-Technical College.

Staff--General

Several studies of community-junior college staff have been made. Hurlburt summarized those received by the Eric Clearing House for Junior College Information:

> Adequate preparation for junior college teaching includes depth in one or more substantive fields at the undergraduate and graduate levels, professional preparation carefully related to the nature of the junior college and the characteristics of its students, and an internship or other supervised junior college teaching experience... Junior college teachers have a particular need to be able to adjust their subject matter specialty to junior college conditions, to reach a diverse body of students where they are, to accept the open door policy and to put the emphasis on teaching. The majority have had experience in elementary or secondary schools and are generally considered competent in their fields. However, the research is vague on how the teachers' preparation or methods relate to classroom and students. How does a teacher behave who understands the developmental needs of students in the early college years?[8]

One study reviewed showed similarity between community-junior college and senior institution staff in all except degree level obtained. Citing Gleazer, Hurlburt also noted that adequate preparation requires the cooperation of senior institutions as academic and research centers with community-junior colleges as laboratories:

> The kind of teacher that hopefully would be produced by such a coalition is a teacher with strong academic and teaching ability combined with strong guidance ability, proficient in teaching general education courses as well as specialized fields. The importance of classroom teaching as the primary responsibility of the junior college instructor was reiterated.[8]

A study by Montgomery[9] of public community-junior college teachers in Florida found 12 percent with doctoral degrees, and 77 percent with master's degrees; fifty percent had taught in senior institutions, while almost 70 percent had some elementary or secondary experience. One third of the teachers had come directly from high school teaching, one fifth from college teaching, almost a third from graduate schools, and smaller numbers from business, industry and related areas. Christopher[10], using a list of statements developed with a panel of experts, sent questionnaires to all 148 teachers in Wyoming's five community-junior colleges--only one of which had a vocational program. Almost all teachers had a master's degree and the majority had secondary school experience. This was reflected in the reason given by 72 percent for choosing community-junior college teaching--"freedom in the classroom and a less rigid schedule."[20] Many teachers attended summer school or pursued independent study, and vocational teachers reported summer work experience related to their specialties. Some teachers reported no additional college work. A degree beyond the master's representing advanced work of a broad nature was favored over the Ph.D. As a whole, orientation programs and in-service programs were not available. Most held memberships in professional organizations. None of the teachers had graduated from a program of community-junior college teaching, and only 20 had taken any course specifically related to the community-junior college. Only 12 percent felt that such a course should be required, and the majority did not feel that supervised teaching or an internship in the community-junior college was necessary. Professional education courses if really related to the community-junior college or methods in their field were favored by 59 percent, but 41 percent would take professional courses only if required. They did favor departmental in-service programs, and help from department heads. On the whole, they believed teachers should be familiar with principles of guidance and should advise students on academic and career problems leaving personal problems to the counselor. They seemed aware of the many unique goals and objectives of the community-junior college, but one-fifth favored admissions standards; some believed adult classes should be in the high school, and a number opposed adding vocational courses, which would lower the school's prestige. They favored only such research as would help their school. They were satisfied with their image in the community, did not favor certification for teachers, and were not concerned with a system of faculty rank. A substantial number felt communication between administration and faculty could be improved, and almost all favored an advisory committee of members from the five community-junior colleges and the senior institution to work on common problems.

Staff--Issues and Problems, General

The best comprehensive study of the community-junior college faculty is that by Roger H. Garrison[11] based on visits to 20 colleges (which were representative of the heterogeneity of community-junior colleges throughout the nation) and on informal, confidential interviews with more than 650 teachers, deans, and other personnel. The resulting identification of problems and issues are presented from the faculty viewpoint. The teachers see themselves as student centered and accept the often extreme variations in ability and purpose among their students, but the open door policy involves tremendous problems in adapting content and method to such a heterogeneous group. The emphasis is on teaching. Problems of administrative organization that involve trustees, local boards or state agencies, state legislatures, and innumerable rules and regulations hamper effective operation and teaching. Budgets are inadequate; red tape and time are involved in acquiring even small amounts of needed equipment. Too much influence of senior institutions and accrediting agencies in specifying transfer courses hamper the development of the flexibility which teachers would like in devising courses, texts, materials, methods, and scheduling to fit the needs of students. The rapid rise in enrollments and the growth of multi-campus systems is causing an impossible work load for college administrators and faculty, complexity in lines of communication, more rigidity, and an isolation of faculty from an active part in the concerns of the total college. (This includes isolation from those in other disciplines in their own department and college, and from colleagues in other institutions.) The teaching load ranges from 15 to 20 teaching hours a week with the number of students in each class increasing constantly. Open office hours with a constant flow of students makes committee and departmental meetings an added burden. Teachers constantly mentioned lack of time as the major problem. There was inadequate time for helping individual students, for adequate preparation, for professional reading, and for thinking. An English teacher mentioned that the number of students was so great that needed compositions could not be assigned because there wasn't time to read them. A speech teacher commented that it took nine weeks before each student in the class was able to make one, three-minute speech. Teachers were concerned with the lack of both time and money for their own professional development which is so vital to effective teaching. Most in-service programs were haphazard and not adapted to the teachers' needs. A great need was expressed for some sense of identification and communication with their own profession. Like the Wyoming teachers they looked to the senior institutions for help and desired meetings of community-junior college faculty with senior institution personnel to discuss common problems. They wanted help from the senior institution in the organization of survey courses, in the selection and presentation of material at the freshman-sophomore level to the heterogeneous community-junior college population. Funds were also necessary to allow them to attend meetings, summer institutes, etc. The Ph.D. degree was not considered suitable to community-junior college teaching needs. They suggested changes in the masters degree--it should be broadly based and interdisciplinary with experience in the community-junior college and professional course work clearly related to the nature of community-junior college students and teaching.

Garrison[11] then summed up some of the problems and suggested recommendations. The situation of the community-junior college teacher is new and requires unorthodox solutions. He is often treated as a high school teacher, but he is not one. He deals with college-level students and works with college-level material. He is not, however, the counterpart of the senior institution teacher instructing in the first two years of the college program. The community-junior college is pragmatic--it must turn out employable or transferrable students. The chief problems are the often too restrictive regulatory context in which the teacher and his immediate administrators do their work and the lack of time and money for doing an effective job. The sheer management of numbers alone is a staggering administrative task. The key to quality is the skilled professional teacher, but with the present pressures, second-rate learning experiences for tens of thousands of students will result. Garrison recommends a national committee of experts for community-junior college faculty to develop guidelines for appropriate graduate work, special summer or in-service programs of real value for continual professional development, workshops for administrators, faculty load, problems of instruction, effective departmental instruction, and other specific problems. A national clearinghouse for information, a job clearinghouse, and a center for community-junior college studies were suggested. Better lines of communication are needed. Liaison of community-junior colleges and senior institutions is necessary for discussion of teacher preparation, for developing courses and methods in community-junior colleges, and for making the senior institution aware of the problems of the community-junior colleges in the areas of transfer of students and credit problems. The community-junior college should be free to develop courses to fit the needs of students, and senior institutions should be more flexible in their acceptance of these courses. Communication of experiments and experiences at other colleges is a necessity. There is a need for a national community-junior college faculty organization and for the acceptance of the faculty in national professional organizations on an equal status with senior institution personnel.

Garrison (1968)[12] has also written an orientation for new teachers. He describes types of community-junior colleges and administration, nature of the programs and students, and its place in higher education and its philosophy of instruction. He describes the heavy teaching load and the small opportunity for further study or even conference attendance, relation of goals of the community-junior college to teaching, faculty participation in college government, adapting teaching to a variety of students, and the shortage of clerical help and supplies. He offers advice, gives examples of good methods, and provides a checklist for evaluating one's efforts.

Possible Source of Community-Junior College Teachers--General

Retired military personnel have been suggested as a resource in the recruitment of vocational teachers. In a study of 66 that are teaching in Florida community-junior colleges, Rogers[13] used questionnaires to administrators, students and subjects, plus use of a teacher evaluation form. He found no statistical differences between retired military personnel and career teachers or between those who attended graduate school after retirement and those who did not. (The only difference found was that those who were academy graduates rated significantly lower than other groups on the variable of relationships with others.) The retired military personnel were particularly good in the science and mathematics areas. They seemed to adjust well and be accepted by faculty and students. They did feel that they were competent to serve as administrators without further training, but administrators felt that they needed teaching experience first.

Vocational-Industrial and/or Technical Staff

In describing the faculty needed for community-junior college technician programs, the U.S. Department of Health, Education, and Welfare's criteria states that the vocational or industrial arts teachers should not be used in technical programs. If possible, teachers of general subjects should be used who are teaching these courses specifically for technicians or who have been given some training in the needs of technicians. Diverse education and employment background should be the goal in selecting staff. F. Parker Wilber (See Richardson.)[2] states that technical faculty should be highly specialized, oriented toward their subject fields, and qualified by occupational experience. Strict uniformity of standards is not feasible since the subject to be taught may require varied amounts of education or work experience. In general, the staff should equate ability and experience with the middle management level in business or industry. The evening teacher should have a total of five years of occupational training and work experience, the full-time day teacher seven years. Seven years of vocational experience should be equated with a bachelor's degree on the salary schedule. Dobrovolny[14] in presenting the details of an electronic technology program specifies that the faculty must have technical proficiency, industrial experience, understand philosophy and goals of the program, and be able to work with the rest of the staff so that the program will be an integrated whole. The criteria of the U.S. Department of Health, Education, and Welfare also mentions the need with early in-service training for proper organization and coordination of the faculty involved in the education of technicians so that mathematics, science, and communications will be definitely related to the technical courses. This material should be presented when the student needs it.

A survey of 295 technical teachers in ten 2-year colleges in New York State with returns of 131 indicates that technical teachers feel that college credit should be given for industrial experience to update them in their technical skills and that they should be allowed to teach in other than their technical specialities. This study also revealed that the technical teachers also felt that promotions should be based on a variety of considerations including in-depth industrial experience, professional licenses and many other factors. This same study revealed that there is a need for a new bachelor of science degree in engineering technology for teachers. The study points out the fact that there is need for articulation of qualified two-year college graduates holding the A.A.S. degree who can transfer to a senior institution on a "one-for-one credit basis". Eno "suggests that a new baccalaureate program in engineering technology might prove to be a most desirable source for technical teachers".[15]

Larson (1965)[16] surveyed teachers in industrial-technical education in Michigan's public community-junior colleges in 1960-61. One-half of the 138 instructors in 11 colleges had a master's degree usually in industrial education, industrial arts, or vocational education. Sixty-five percent had 12 hours or less in teaching methods. While the median number of hours in technical subject matter was 18, one-fourth reported more than 48 hours. Twenty-one teachers had completed an apprenticeship; the median of closely related work experience was four years and the median number of years of teaching experience was eight. Thirty-eight percent had both community-junior college and vocational experience. Data was taken from the files of the Superintendent of Public Instruction. Podesta[17] in a study of vocational education in Santa Clara County, California, obtained data by questionnaire. Of the 66 community-junior college trade and technical teachers responding, two-thirds were part-time and usually held a job in industry. Educational attainment on entry into teaching ranged from 10th grade to the doctorate level, with 22.7 percent having no work beyond high school and an additional 33.3 percent having some college but no degree. At the time of the survey, slightly less than half still had not attained a degree. Fifty-three percent began their teaching careers in the community-junior college, 13.6 percent in the secondary school. Barlow and Reinhart[18] obtained data on full-time trade and technical teachers in California in 1966-67. Of the 1,587 teachers, 65.7 percent were employed in community-junior colleges. Compared to high school teachers they had more formal education, higher salaries, more work experience, were older, and held more memberships in professional organizations.

Norman C. Harris would (in light of the critical shortage of teachers) change the normal utilization of staff and space, with good teachers presenting lecture material to large groups, learning centers staffed by technicians equipped with various self-learning devices, and laboratories and shops in which aides might be utilized. (See Richardson.)[2] Some of the plans for new schools utilize a differentiated staffing concept to some extent. Allen and Wagschal[19] have suggested that it be carried even further with differentiation of staff on a vertical scale according to a differentiated series of responsibilities and competencies required to handle them to be identified for each staff position. They have also suggested that a differentiated staff is particularly applicable to vocational education. Some community-junior colleges are already making use of a differentiated staff to some extent, often in connection with the programming of learning in some units of a course where aides and laboratory assistants can handle routine tasks leaving the teacher free for group lectures and special assistance to individual students. Mathematics and remedial English are frequently organized in this way. Skill centers are also found in community-junior colleges with special study, laboratory, and resource areas. Teacher education courses should take cognizance of these developments as they affect both secondary and post-secondary teaching.

A prime need for all community-junior college staff mentioned by Garrison,[12] Barlow, and Reinhart[18] is to find time and opportunity for professional development to keep up-to-date with developments in their own speciality and in educational areas. Another need is that for greater communication with teachers from other community-junior colleges and from the university to provide both stimulation and interchange of ideas.

Vocational-Industrial and/or Technical Facilities

The capital outlay required for vocational programs is high. Wilber states that in California it has been about $6,000 per student and more for certain technical programs in metallurgy, electronics, plastics, or engineering. (See Richardson.)[2] The wear and tear is greater than in industry and equipment may become obsolete; so there must be, therefore, an adequate replacement budget. Without adequate monies the program cannot be successful. There should be an annual review of equipment and facilities in each area, with an advisory committee assisting in the review.

Not only is the capital outlay high for community-junior college vocational and technical programs, but the cost of educating a student in these programs is also high. Ernest Anderson[20] made a study of the differential costs of curricula in eight community-junior colleges by figuring the per student costs of the courses in typical associate degree programs. In the cost figure he included salaries, auxilary charges, maintenance, (all institutional expense except capital outlay). Engineering technology costs about twice as much per student as liberal arts transfer programs, industrial and medical technology about one and a half times as much, home economics and dietetics 1.2 times as much. Liberal arts costs slightly more than business and public service programs. On a student credit hour basis, vocational curricula costs may exceed liberal arts by as much as 300 percent. The higher costs of vocational technical programs seem to be the result of small enrollments in combination with large numbers of class contact hours.

In vocational courses the quality and variety of equipment, instructional materials and supplies are of basic importance. Burt[7] discusses the help that can be had from industry in advice and loan or donation of equipment. Some of these may be scrap to the company, others are given because of the employer's interest in the school. Government surplus is also a good source for needed equipment.

The Los Angeles Trade-Technical College estimated that about one million dollars worth (or about one-fourth) of their equipment has been donated or loaned by industry. Some schools place a plaque on the equipment identifying the donor. Equipment does not always have to be the latest since many students will be using older equipment in their jobs. But arrangements should be made with companies having the newest equipment for students to become acquainted with it. However, equipment should not be allowed to become obsolete.

A sharing of facilities by high schools, community-junior colleges, and senior institutions near each other, (and even a sharing of staff) is working in a number of instances when such facilities are not used to capacity by the owner institution. Both Kansas and Arizona have officially stated that wherever possible expensive facilities are to be shared, not duplicated. Institutions can also contract with industry for provision of facilities and staff for some technical programs.

New Mexico State University (See Kleine.)[21] remodeled a 40-passenger army surplus bus to provide mobile laboratory facilities for classes in applied electricity at branch community-junior colleges. Equipment was equivalent to that at the university, and its total cost was $7,456. There were eight work stations accommodating 16 students. There were trained instructors at each location, and the same text and course outlines were used. The operational costs are lower than for permanent facilities.

The facilities for a teacher education program should be dictated by the needs of the curricula, the staff, and the services to be provided. The students should have ready access to all necessary facilities even though they may be in another department. They should be flexible enough to permit modification for curricular changes.

The problems created by inadequate space, obsolete and inadequate facilities for a university industrial education program in which teachers are trained are explained by Turner,[22] who is dean of the School of Industries at Texas Southern University (a university primarily for Negroes). Students enter either directly from high school or from community-junior college and the program is well articulated with both types of schools. Many of the graduates teach in secondary schools. However, improvements in high schools and community-junior colleges have resulted in well equipped programs. Students may have difficulty appreciating the offerings in the School of Industries after being accustomed to new and good facilities. The community-junior college transfer student may feel he has entered a program inferior to the one he has finished. New and up-to-date programs should be offered. Offerings at present are limited and follow traditional patterns. Facilities and faculty are needed even to update these. Comments from graduates are included in the report, recommending both improvement and expansion of the program to meet the needs of industry, employment, and teaching careers.

Larson (1966)[23] has developed a unique design for a technology resource center for in-service institutes. It incorporates both flexibility and maximum utilization for conducting all types of programs.

Planning Facilities

In planning facilities for post-secondary technician programs, the guidelines of the U.S. Department of Health, Education and Welfare's Criteria for Technician Education states that classrooms and lecture-demonstration rooms should be equipped with necessary teaching aids and demonstration equipment. In designing laboratories, maximum consideration should be given to modular construction, flexible use of building spaces, and the use of portable equipment to provide economical adjustment to growth or change in the program. There should be office space providing privacy, conference rooms, preparation rooms, and storage space. Laboratory equipment and facilities for technician programs must be of high quality if the program is to meet its goals, but the most expensive apparatus may not always be needed. Simulation, demonstration, and teaching systems specifically designed for teaching certain units should be investigated; but the student should also have the opportunity to use the real apparatus. Surplus equipment from private or public sources can save money if it is really needed in the program. Leasing or renting equipment is sometimes advantageous.

When planning facilities, careful study and consideration should be given to several recent trends, such as the campus plan as compared with the compact plan, core cluster planning, team teaching, modular scheduling, centralized storage, modular design, utility walls and columns, learning resource centers, utilization of the total facility as a learning-teaching laboratory, environmental control, and accomodation of physically handicapped students. The key to successful planning for the future is flexibility, and providing the kind of facility which can be readily adapted to changing programs and needs. Good facilities cost about the same in the end as poor facilities. Economy results from effective planning (Larson, 1968.).[24]

Most of the curriculum guides for technical courses issued by the U.S. Department of Health, Education and Welfare, by universities or national associations contain lists of equipment needed and shop floor plans. A series of facility planning guides in ten related vocational and technical subject areas have been developed by the Center for Vocational and Technical Education and the Administration and Facilities Unit at Ohio State University. The Center will also publish a general vocational and facility planning guide for a single program or an entire school. Typical of these is the facilities guide by Larson (1968)[25] for courses in the machine trades. The curriculum, program content areas, types of learning areas, possible use of team teaching, and mechanical teaching aids to be used must be considered in planning. He discusses groups to be served, space for expansion, safety, mobile equipment, movable partitions, etc. A government publication written by Chase[26] was issued in 1965. A Basic Planning Guide for Vocational and Technical Educational Facilities Information is also available from ~~the Educational Facilities~~ Laboratories, 477 Madison Avenue, New York, from the School Planning Laboratory at Stanford University and from the American Association of Junior Colleges.

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Guidance and Counseling

Guidance and counseling for teachers of industrial education is related to the total status of guidance and counseling from high school through community-junior college into senior college. It is also related to the total picture of occupational guidance at all three levels. Without adequate knowledge and understanding of the world of work, the counselor cannot have much understanding of the aptitudes, abilities, interests, requirements, and training needed for teachers in industrial education.

Vocational Guidance

The 1968 Report of the Advisory Council on Vocational Education[1] contains both a broad statement of the need for and a gloomy assessment of the present status of vocational guidance in general. As stated in this Report, the need is "urgent today in a highly technological society which lists more than 35,000 occupational titles and which holds the promise of hundreds new and still unnamed occupations."[1] The ability to assess personal qualifications, interests, and abilities in relation to possible occupations is often difficult or beyond the capabilities of many youth and adults Almost nine out of ten high schools provide academic counseling, largely because academic guidance services have expanded rapidly under the National Defense Education Act. Only cursory attention, however, has been given to the development of quality vocational guidance services. Although vocational guidance exists in half of the high schools, "it is inadequate in most cases or extra duty imposed upon an already overburdened academic counselor whose interest and professional preparation are oftentimes foreign to vocational counseling."[1]

In 1966, only half the states were employing vocational education funds to support at least one person on the state staff with specific responsibility for vocational guidance and counseling, and only eight states reported more than one such person. While no data are available specifically on vocational guidance for the occupationally oriented student, indications are that very little improvement has been made.

A 1967 study by Kaufman and Schaefer,[2] concerned with high school graduates not going to college and based on data from 25 schools in nine communities in the northeastern United States, reported that only a minority received any vocational guidance and that essential interest and aptitude tests are not typically used in high schools.

Counselors, as John L. Feirer has said, need to be concerned with the needs of all students and not be just "college advisors and amateur clinical psychologists."[3] They must recognize the importance of vocational and technical education. Far too many counselors have never had any work experience. They need college courses in the typical areas of vocational and technical education taught by specialists in these areas and should be required to have a year of experience in earning a living outside the academic atmosphere.

Community-Junior College Counseling Needs

In the literature regarding plans for the establishment of new community-junior colleges, much is said about the importance of guidance and counseling in helping the many types of students find their places in the diverse programs. Johnson,[4] in his book on Starting a Community Junior College, states that counseling and its organization should differ with the size and characteristics of the college but that it is essential to provide highly qualified counselors including those interested in and knowledgeable about occupational skills. Faculty should be involved in advising about and receiving in-service training, with difficult cases being referred to the counselors. There should be counselor specialization in occupations with study of those in the area and visits to other community-junior colleges with strong programs in vocational counseling.

Bossone,[5] in "Understanding Junior College Students," recommends meetings of staff and counselors to discuss students' problems, enlistment of leaders in occupations to give students a realistic picture of work, work with students on remedial courses or how-to-study helps, and pre-entrance counseling which would not neglect financial problems. The community-junior college talks about the importance of counseling; but, too often, counselors are testers and program advisors.

Medsker[6] found that counseling programs in community-junior colleges showed great variety in organization, administration, and assignment of roles. He suggests that with a good counseling program there should be a greater proportion of students in courses leading to employment rather than to transfer.

A 1967 survey by the Michigan State Department of Education[7] to determine perceptions of counselors' roles at present and in 1970 (solicited by interview and questionnaire) received opinions from presidents, deans of students, faculty, and counselors of 21 community-junior colleges. Student counseling was considered to be the most important function and typically was conceived as individual interviewing on academic achievement problems, vocational decisions, majors or colleges to attend, personal problems, and interpreting test results. Most agreement was found on responsibility for applicant consulting, education testing, group orientation, career information, and student advisement. Increased involvement by 1970 was perceived in the areas of institutional research and group work with students. Limitations of staff and facilities were frequently mentioned as problems.

Community-junior colleges currently enroll more than a million students and are rapidly increasing in both number and size. These colleges are characterized by an "open-door" admissions policy which welcomes any high school graduate or adult, comprehensive and diversified programs of study, and a great diversity of students. When one considers the community-junior college in this light, the need for adequate career guidance and personal counseling is self evident.

Community-junior colleges recognize this as one of their functions, but how is it being done and how should it be done? Community-junior college counseling has a unique function in a time of rapid change for students when they are making critical educational and vocational decisions. Medsker says in his contribution to the McConnell Report that "probably never again will these students be confronted with such a large number of important decisions during such a brief period of time many of which will affect the rest of their lives."[8]

Community-junior college counselors need to have a much sounder foundation in the area of vocational counseling and the means to keep their information up-to-date. They are also in a middle position (a coordinating link between high school and senior institution programs) and must maintain liaison with both groups if their service is to be effective.

Counseling in the Community-Junior College

What is the actual situation in community-junior college counseling? The most complete study is that finished in 1965 under a grant from Carnegie Foundation by the National Committee for Appraisal and Development of Junior College Student Personnel Programs with T.R. McConnell as chairman and Max R. Raines as project director.[8] (Collins[9] has presented a brief and popular summary of this study.)

This comprehensive study found guidance practices woefully inadequate. This is extremely significant for occupational education. With the growth of new community-junior colleges, greater emphasis on and development of new courses in occupational programs, and the limited acceptance of these programs by both educators and the public; the need for guidance personnel with knowledge and understanding of both the occupational fields and the potential students will become even greater.

The community-junior college has become the place for self discovery for the student where he must learn to assess his abilities and interests to bring his aspirations in line with these and gain maturity. The student is likely to do these things effectively only if the college recognizes the process of self discovery as one of its principal purposes and if the institutions' personnel services are adequate in scope and quality to give the student the necessary assistance.

Some of the characteristics of community-junior colleges may operate against student development. Local control, vocational horizons limited by the locality, and growth in maturity hampered by living at home may hurt rather than help the student. The size of enrollments in large community-junior colleges may cause the individual to become lost or alienated. Pressure on the tax dollar may also affect student personnel services.

Other characteristics of the community-junior colleges must be considered. In 1966, fewer than half of the students at such colleges were full time. Many of the students are from minority groups; many are characterized by poverty, lack of both money and knowledge, and deficiencies in reading skills. The attrition rate is high. About 75 percent enroll in transfer programs but less than half of this number actually transfer. Goals of students are often unrelated to abilities and many are undecided. If the community-junior college is to fulfill its function, adequate counseling and guidance is an absolute must.

Thirteen simplified types of community-junior college students are presented by Collins[9] to illustrate the great diversity and to show that the student personnel program must be the core of the comprehensive community-junior college.

Student Personnel Programs

The McConnell Report[8] attempted to identify the characteristics of an effective program of student personnel services, to set up criteria for evaluating these services, and to appraise such programs in a representative sample of community-junior colleges. A series of 21 functions of personnel services were identified by professionals to serve as the criteria. These are grouped under the headings of orientation (including career information), apprisal, consultation, participation (including student activities), regulation (including registration, academic, and social), service (placement and financial aids), and organizational. The organizational function includes program evaluation, follow-up, administrative setup, in-service education, and program articulation (including that with high school, senior college, business or industry, and within the community-junior college itself).

The study evaluated the level at which these functions were being performed, attitudes of staff toward the functions, the training of the staff, and the relationship of the type of organization to performance. The sample, representative of all geographic areas and of all types of colleges, consisted of 49 community-junior colleges with enrollments over 1,000 and 74 smaller colleges. Questionnaires, interviews, and campus visits provided the data, with a more intensive study of the larger colleges. Two instruments were developed to show who performed the functions identified and at what level, the roles of student personnel workers and their preparation, and institutional characteristics which might affect the development of student personnel services.

There was high agreement among all colleges on the legitimacy and measurability of the 21 functions, but there was much disagreement on their being functions of student personnel, particularly from the smaller colleges.

The study found current guidance programs are far from being adequate. Three-fourths of the colleges had inadequate programs. Of the 21 functions, only 25 percent of the colleges studied were meeting their responsibilities in a satisfactory manner; and with the larger colleges a rating of excellent was found in fewer than ten percent for each function. Only five of the 21 functions were even satisfactorily performed by two-thirds or more of the colleges. These were pre-college information, student registration, student self government, academic regulations, and co-curricular activities. Even the key function of student counseling was being performed adequately by only 40 percent! Guidance was not found to be one of the major attributes of the community-junior college.

Certain institutional characteristics, particularly clarity of staff roles become determinants of adequacy in the performance of function, but placement of administrative responsibility does not seem to have a causal relationship with adequacy of performance. Adequate staff, space, clerical help, and administrative support were also important. Student evaluations rate some functions highly but their overall assessment makes some widely held (and believed) views of community-junior college personnel programs look like myths.

No relationship was found between the graduate training level of the supervisors and student personnel workers to performance. Data raised doubts on academic preparation and led to a study of graduate programs for counselors at 106 institutions, the only ones found with any graduate courses in college student personnel services or counseling psychology. Fewer had a real program, and only six offered programs specifically for the community-junior college, which has specific needs and problems differing from those of secondary schools and senior institutions. Training for student personnel functions other than counseling, such as registrar, financial advisor, or student affairs specialist was very rare.

Of the 61 graduate schools responding to a questionnaire, only about one-third favored special courses or field work in a community-junior college. In-service training, however, did have a relationship to performance. Most community-junior colleges suffered both from deficiencies in the training of guidance personnel and serious understaffing. Supervisors were also deficient in training. In the 49 large colleges, only 60 percent of the deans of students had master's degrees in behavioral and social sciences and only 80 percent had doctoral degrees. Raines[8] estimated that 800 full-time trained counselors in 719 colleges made a ratio of one counselor to each 1200 students.

Recommendations included allocation of sufficient funds, cooperation of the president, board, and faculty and good leadership at the state level in state system schools. The state legislature must be cognizant of the needs.

The study found that Florida and California with good state-level support ranked above the other colleges. Other recommendations were the clarification of roles; use of local research; fostering of creative ideas and concepts; provision of adequate facilities, equipment, and professional staff; in-service training to upgrade present staff; special graduate curricula; and consultants in the field who would be available to community-junior colleges. Six community-junior colleges (three in California, one each in Florida, Michigan, and New York) were selected to act as regional or university-connected demonstration centers where model student personnel programs might be developed.

The failure of the student counseling and guidance services in the area of career information and services was particularly serious when technological advancement and rapid change are making career planning difficult. Even the larger colleges functioned in this respect in only a nominal fashion. Ninety percent, particularly the small colleges, were doing nothing to improve services. Almost none of the colleges were providing up-to-date and comprehensive career information with any effectiveness. "If any effort was made at all, it usually consisted of an outdated file of occupational information that was seldom used by counselors or students. Those colleges which have attempted to do more have found it difficult to identify suitable sources of information that can be used effectively in group guidance or individual counseling sessions."[8] The Committee recommended that regional centers for collection, analysis, interpretation, and distribution of career information be established.

Two needs identified for further research, and on which some preliminary research was done in the demonstration centers, were the use of group interviews, particularly in occupational counseling, and of special training for faculty advisors who have individual contact with students in their fields. Better mutual understanding between counselors and faculty advisors is needed as well as delineation of roles.

Two studies of student evaluation of counseling services are reported by Medsker in the section on the student which he wrote for the McConnell Report.[8] In 1962, a ten percent sample of full-time students in Florida community-junior colleges (more than 1700 students) evaluated these services.[10] Over 70 percent felt that information on transfer and occupational programs was adequate. Attitudes on counseling or educational planning were favorable while those on counseling regarding personal and social problems were less favorable. Forty percent did not understand the available services and 48 percent found unclear the interpretations of test scores. In the 1965 unpublished New York State study made by the Department of Education, students felt that, while their advisors were trying to help them, they did not give enough time, did not have adequate information about curriculum requirements, and did not understand students needs. In both groups, about 30 percent of the students had neutral or negative attitudes toward all aspects of counseling.

The Florida study[10] also evaluated other aspects of student personnel services. Twenty-two percent were negative toward help received from faculty advisors, almost 40 percent rated student activities as inadequate, and one-third said that student government was ineffective. They found it difficult to obtain information and help about scholarships, loan funds, and part-time employment. Placement services were also given somewhat low ratings.

Other Viewpoints on Student Personnel Services

Roger H. Garrison[11] in his study of community-junior college faculty presented the faculty viewpoint on counseling and guidance which with a few exceptions was one of dissatisfaction with these services both in high schools and at their own institutions.

High school counselors often consider the community-junior college as the place for those who can't get into a senior institution and have inadequate information about the colleges and courses in their own area. One person commented that community-junior college guidance people were making regular visits to the high schools with very good results. The intra-institutional problem was that of poor communication between faculty and guidance staff; the latter often being uninformed about the programs of their own college, of curriculum changes, and of the requirements for specific courses. A crucial time was registration. At one college there were 18 people to process 4500 students in two days. It was impossible to do a thoughtful job of assigning students to appropriate courses.

The Fifth Annual Community College President's Institute in 1965[12] had as its theme the administration of student personnel programs. Lack of programs geared to the needs of its diverse student body with its wide range of abilities, of programs for remedial and slow learners, for retraining of adults, for students at varying levels of ability, and lack of adequate counseling too often makes the "open door" a revolving door. Since much information counseling is done by peers, the college must make clear to faculty and students what it stands for. Total environment is as important as classes in its influence. Group sessions can be used for students in the same area. Group guidance for students with common problems as carried out in the St. Louis Junior College District is described by Witherspoon.[13]

At a conference on occupational education sponsored by the Midwest Technical Education Center and the American Association of Junior Colleges in 1966,[14] Clyde E. Blocker discussed student personnel services for occupational education. These services must have a functional relationship to the student. The psychological needs to become emotionally and economically independent, with their attendant problems and possible maladjustments characteristic of many community-junior college students, must be understood. A significant number are emotionally immature with a lack of definitive occupational and educational objectives and a dependence on others for personal decision making. The community-junior college has these students for only a short time. Occupational education requires a firm base in guidance services if it is to serve students adequately. Using the McConnell Report as a background; Blocker[14] points out the difficulties created by schisms between academic and occupational personnel, the traditional academic outlook of many colleges, the lower status of guidance personnel in many colleges in relation to the teaching faculty, the training of faculty in subject matter with little or no understanding of students or of vocational needs, the inadequate training of guidance personnel, the need for greater awareness and involvement on the part of the administration, and the lower status in the minds of administration and the public of of occupational programs.

Pre-Registration Counseling

The necessity for pre-registration counseling has been mentioned by several authors as well as the inadequacy of counseling in conjunction with the rush of registration. An institutional study at the College of San Mateo[15] (California) of student evaluations of counseling by the college staff in the week prior to registration found that only half of the students found it adequate. Sources of satisfaction were counselors' understanding and knowledge and help in choosing courses. They complained of insufficient time; the longer the interview the greater the satisfaction. Students who had already decided on a major were better satisfied. Counseling should be more personalized and start earlier.

Medsker[6] found of value summer counseling using test results and other pertinent information and giving each student adequate time and opportunity to discuss educational and occupational plans. Pre-enrollment counseling is important in the industrial and technical areas to determine whether a student is better suited to courses for a skilled trade, technician, or other level. Remedial work and deficiencies in high school preparatory courses needed can also be determined prior to registration. Financial and personal problems can also be discussed. The high school counselor should provide the college with all pertinent information on each student.

Orientation

Orientation for beginning community-junior college students is also, in part, the counselor's responsibility. Medsker[6] states that in some colleges a one-semester course was given which included such subjects as how to study, information on occupational and educational requirements for different jobs, and the meaning of test scores.

At the 1966 conference on occupational education sponsored by the Midwest Technical Education Center and the American Association of Junior Colleges, Blocker envisioned a counselor-faculty team for a "vestibule program"[14] which would include an opportunity to sample various occupational programs.

The Transfer Student

Counseling for the transfer students at the senior institution also needs improvement. Knoell and Medsker[16] in their study of the transfer student found that counseling about career choice and college programs needs much improvement at all levels from high school through the senior institution. Community-junior colleges should seek feedback from their transfer students in terms of personal problems and experiences to aid them in planning and evaluating their guidance services. Students complained about the lack of information concerning senior institutions which had often led to mistakes, such as not knowing the senior institution did not offer the major the student wanted, failure to complete lower-division courses before transfer, lack of realistic information about costs, and failure to realize when they were in academic difficulty.

While student ratings of community-junior college were unfavorable, counseling services at the transfer institution received even lower ratings. A large percentage reported no personal counseling at either institution and many equated it with program planning. If students said they knew what they wanted, their program was planned with no attempt to help them evaluate the wisdom of their choices. Sessions were too infrequent and too short. At the senior institutions, there was little attempt after the transfer student had some experience at the college to help him with his problems or decide whether a change in his choice was indicated. Transfer students had unsatisfactory experiences with faculty advisors who were generally unfamiliar with community-junior colleges, often disinterested, and seldom available when needed. A relation was found between early decision and persistence to graduation, but an early decision was good only if appropriate to the student's abilities and this required evaluation at all levels. Many students made changes in decisions made at the community-junior college.

The high attrition rate of transfer students also showed the need for counseling in the senior institution. Many dropouts reported receiving no help with their problems. Counselors also need to be aware of varying attendance patterns, employment between periods of study, part-time study, and work-study. These work patterns may affect choice and are often the cause for poor study skills with which the student may need help.

Technical Education in Michigan Community-Junior Colleges

In 1965, Norman C. Harris and William Yensco[17] completed a study of technical education in Michigan community-junior colleges. While the focus of this study is on the need for middle manpower, semi-professional, and highly skilled technical jobs; the need for identifying this group in high school and making certain that they are properly prepared for entrance into community-junior college programs is pertinent to this discussion because this group of students is a resource for future teachers of these subjects. With senior institutions increasing their admission requirements and employers demanding greater knowledge and skills, middle-level youth are ill prepared for work and yet denied admission to college. For this group, the answer is further education at the community-junior college, particularly in occupational programs. Yet, many who attend these colleges, because of their own and their parents' lack of understanding of opportunities in semi-professional and technical occupations, insist upon entering academic transfer programs. Social pressures putting emphasis on the baccalaureate degree are at loggerheads with technological development. There must be information about middle-manpower jobs given to students and parents along with a restructuring of the high school curriculum and guidance services for selection and preparation of these students to enter the community-junior college programs.

There is a great need for trained vocational counselors, "that is those persons who are thoroughly familiar with today's rapidly changing technologies, who can interpret conditions as they are today, and make reasonable forecasts of conditions which will probably exist when the student begins his career. More students need to become acquainted with areas of work which are consistent with their aptitudes and interests. A complete counseling and guidance service needs to be provided which utilizes many indicators of future performance--standardized tests, previous scholarships, interests, and job experiences. Most counselors are well acquainted with academic and college preparatory programs and with senior institution requirements, but not very many are familiar with the needs of industry and with the technical and semi-professional occupations."[17] Occupational information should be given to students early with vocational counseling on a general basis in the junior high school.

The Harris and Yencso study[17] is limited to technician education programs in community-junior colleges in Michigan, the high school preparation for these programs, and the role of guidance services. Data were obtained from a representative 148 high schools by a questionnaire filled out by guidance personnel. These schools contained 53 percent of the total Michigan high school enrollment. Data from interviews with personnel of all community-junior colleges in the state were obtained on current and planned curriculums, guidance practices, and opinions on high school preparation and counseling.

About 45 percent of the 1963 high school graduates were in the college preparatory program, with most of them going on to some kind of post-high school education. Twenty percent selected the general curriculum, and 21 percent choose vocational or industrial arts curricula. Only ten percent of the graduates enrolled in a community-junior college occupational or technical program.

About three-fourths of the high school counselors had some understanding of the necessary preparation for collegiate technical courses and the high school rank indicating success for engineering and industrial technicians. They selected an optimum program from present courses which agreed with recommendations of national agencies; they felt that present math and science courses were too theoretical and not practical enough. The counselors also felt that neither the college preparatory nor the vocational track was adequate and favored a pre-technical program. However, their lack of knowledge was shown in a failure to understand the type of training needed in basic shop and drafting, although they named both courses as necessary preparation.

The inadequacy of high school guidance and the low status of technical occupations was highlighted by the failure of counselors to mention the technical occupations as possible career choices. Seventy-one percent discussed these with students only if the student asked about such courses and jobs. Lack of time was an important factor, with 73 percent of the high school counselors reporting one to two hours per student during a year. Current career information including community-junior college catalogs was available at almost all schools, but its real value was unknown. Inadequacy of vocational counseling is related to the work experience of counselors. Only eighteen percent felt that such experiences were essential, while fifty-three percent felt it was important but less so than college training.

Many different standardized tests were used which could have been helpful in vocational guidance. The most frequently used were the SAT, the Iowa Down Test of Educational Development, and the Physical Science Aptitude Test. Others reported were the Differential Aptitude Test, the National Merit Scholastic Qualification Test, and the SCAT.

Most high school counselors are by training and background well able to advise on four-year and academic college programs; but as one of them commented, "Tradition and background void most counselors for the role of vocational counseling."[17] As a measure of understanding the community-junior college technical programs, the authors used the extent of the working relationship with personnel in the local community-junior college. Rapport was rather poor; 50 percent of the high school counselors did not know the college guidance director, and 54 percent did not know the director of the technical program. Very few knew the subject area teachers. Much better liaison needs to be established for an understanding of the college offerings.

Comments from counselors suggested placing the same emphasis on technical training as on college preparatory courses, workshops, and in-service programs for counselors to become better acquainted with vocations in the technician area, clinics where specific community-junior programs would be explained, visits from the college to local high schools talking to counselors and prospective students, keeping the high school informed about specific programs, kind of student wanted, preparation needed, lists of courses, and progress of the high school graduates in the programs. Also suggested were trained vocational counselors.

In answer to the question of what can be done to make technician occupations more popular, 89 percent of the high school counselors felt that income and better career information to students was essential; 86 percent checked more information to parents; 85 percent checked publicity in general news media; 80 percent checked more and better facilities at community-junior colleges; and 78 percent checked a clearer understanding of the high school preparation needed. Suggestions included career days and career seminars using people from local industry and the college, assemblies for students, newsletters to parents, open houses at high school and college, bulletin boards, and special reading room for career information.

Cooperation with local industry was suggested as was the need for interested students and parents to talk with successful people in the technician area. Principals and counselors should have a specific visiting day at the local community-junior colleges.

The problem of low initial enrollments in both the semi-professional engineering technologies and the highly skilled industrial technologies was attributed by college personnel to inadequate career counseling in high schools for middle level students, lack of a specific preparatory high school program,poor status image, and lack of recognition of the college programs by industry.

Attrition rates are high for those who enter the programs. Estimates from Michigan community-junior colleges were that only about one-fifth completed the associate degree. Reasons given included jobs for the partially trained; financial need; transfer to apprenticeship or pre-engineering programs; lack of proper preparation in mathematics, science, and English. There has been much publicity about careers in electronics, the result of which was shown in the high enrollments in this area, although Michigan industry has very little to offer in this field. However, there is a national need for these graduates. Many unqualified students have been eager to enroll in technician programs, but students who are qualified try, frequently without success, the pre-engineering transfer program again pointing out the need for guidance in both high school and community-junior college.

Michigan community-junior colleges reported using tests and the high school grade average in determining placement. High school rank was considered a reliable measure with rank about the 50th percentile needed for engineering technologies and above the 30th percentile for the industrial technologies. However, many colleges were not specific in defining their courses and distinguishing among the levels of technology or trades so that guidance was frequently inadequate. The ratio of students to counselors ranged from 500 to 200 per counselor for the entire student body. In some colleges, instructors in the specific technical areas are assigned counseling duties for students in their field.

Guidance is particularly important before registration to help the undecided schedule needed tests and plan courses. This is a weak spot in the community-junior college and its improvement requires good articulation with the high school. Graduate , placement, and follow-up studies were also deficient.

Community-junior college personnel were also asked to suggest what would be the optimum high school preparation. Most agreed on the inadequacy of mathematics, science, shop practice, and drafting as now taught in most high schools. Procedures used for the recruitment of students into technician programs included (in order of rank): liaison with high schools, brochures and publications, information to high school counselors, liaison with industry, college career days for high school students, talks to community groups, frequent news releases, and mail promotion campaigns. "The evidence indicates that well-informed high school counselors and teachers, enjoying close rapport with community college personnel and supplied with ample quantities of attractive, informational brochures to give to students and parents, constitute the best recruiting agents for technician programs."[17]

The authors recommended a pre-technical high school program articulated with the community-junior college; clear distinctions by the colleges between trade-level and technical-level courses; development of curriculums with defined goals and a basic core that would be applicable to changing job demands; cooperation of high schools, colleges, and industry in developing these programs; and development and articulation of high school and college career counseling programs.

At the conference sponsored by the Midwest Technical Education Center and the American Association of Junior Colleges in 1966,[14] Norman C. Harris suggested counseling and testing of high school seniors to determine their ability to enter specified community-junior college courses to help with vocational plans, work out programs, and determine remedial work needed. Community-junior colleges must provide programs on several levels from semi-professional to semi-skilled to meet its goals as an open-door institution. High schools need to be aware of these programs and initiate their own programs to prepare for community-junior college work.

The High School Counselor

The role of the high school counselor in giving vocational advice as defined by Mikalson and Bloomquist[18] in a report on the articulation of high school and community-junior college occupational education in Clackamas County, Oregon. The counselor should understand occupations as well as academic careers; talk to parents; obtain help from employed persons in business and industry; make provision for students to have personal contact with successful persons in careers they are considering; and give the students programs in writing with definite course programs for high school, community-junior college, or on-the-job training. The counselor must understand the specific requirements for certain curriculums and occupations; for example, for certain technical courses articulation with basic mathematics and science courses in high school must be considered. Counselors also should be responsible for seeing that students receive proper guidance in relation to occupational exploratory courses given in the county's high schools.

The Future

Several programs are in the process of development for better preparation of guidance personnel career counseling. The Ford Project for the training of community-junior college teachers for occupational programs[19] makes provision in its internship training for the intern to gain a better understanding of the philosophy, organization, and functions of student personnel services of the registrar and admissions offices, of placement and financial aid, and of the public relations work with the schools and community. The intern also has an opportunity to assist the advisor of one student activity and to work with both counselors and faculty advisors. St. Louis University, which is cooperating with this project, has a graduate program for counselors with specific training for community-junior college and occupational counseling.

Project Accent (See Chandler),[20] a cooperative plan of the San Bernadino College and ten surrounding high schools, is designed to develop coordinated counseling and instruction in grades 11 to 14 in auto mechanics, applied electronics, and office occupations. This project makes counselors an integral part of the program. They are being retrained to actually give vocational-technical counseling. A counselor from the college meets regularly with most high school counselors to work on the identification of students most adapted to the programs, on ways of interesting students and parents, on ways to develop adequate and exact information for counselors about each job, and to transmit all information on latest high school and college programs available. Counselors take part, along with teachers from each high school and a supervisor from the college, in a public information work group to devise material needed to give students, parents, teachers, and employers information on vocations and training. Since it was found that most counselors are college oriented with little vocational knowledge, the workshops for counselors start with visits to the facilities in their own schools, in the other high schools, at the college, and at special vocational schools followed by visits to job sites and training facilities in industry. Each successive year the fields in which counselors are given experience and information are broadened. This is done in conjunction with the production of locally produced videosonic packages of 35mm slides and audio tapes giving exact information on jobs, pictures from local industries, and experience stories of local workers. Voices of students, counselors, and graduates can be used. They will be varied for each high school and kept up to date. Local industry is cooperating in the project.

The Need

The community-junior college and the high school counselor both need information on occupations, manpower predictions, and changes in needs at national, state, and local levels. Materials can be obtained from the Federal Government on general trends, area surveys, and specific occupational areas. The latest edition of the Dictionary of Occupational Titles with its stress on occupational families should be of special value to vocational educators and counselors.

There have been several recent experiments in ways of handling the information on specific occupations. VIEW developed by San Diego County as reported by Pierson[21] has developed up-to-date information on many occupations (including area conditions and needs) which is transferred to microfilm inserts on large cards. These cards can be filed in a number of ways including by the Kuder Test. Students can use the material with the reader or make their own copies. A Delta College group from Michigan[22] spent a summer visiting community-junior colleges throughout the country to help in the betterment of their own program. The visiting team was very much impressed with VIEW. It took little space and little of the counselor's time. Additional material in the library was listed on the cards. A computer-based occupational information system that will selectively present information in accordance with individual needs has also been developed and described by Impellitteri[23] and Harris.[24]

The Delta College visiting team also recommended the development of an occupation testing program with reference to their own program similar to that in use at the Los Angeles Trade and Technical College. These tests were developed by the college and are constantly revised to guide their students in some 55 different curriculums. The college says that they have been so successful that 90 percent of the students finish their courses.

Role of Faculty in Guidance and Counseling

Faculty are utilized in community-junior and senior institutions as advisors and, frequently, for some counseling duties. The faculty-student relationship may be a good one so that the student may go to his faculty advisor for various kinds of help. It may be a poor one with insufficient time and interest given the student. Faculty advisors should only be assigned students who are certain of major and career plans and are in their own fields. They must be given sufficient time from other duties, have a private office and easily available records, and should know when to refer a student to a counselor.[6]

The need for in-service training for faculty advisors and the need for faculty-counselor rapport and coordination of roles is generally recognized. Blocker[14] has stated that, as the staff member most closely in contact with the student, the faculty advisor is important; but a professional counselor is needed for broader and more intensive services, such as problems of vocational and curriculum choice, testing, and psychological problems. However, especially in a large school or university, the counseling services are apt to become isolated and the many specialities in student personnel in areas such as admission, financial aid, student activities, etc., confusing to the student. Blocker advocates the need for departmental counselors. The counselor should be housed where the students are; where he may interact more readily with faculty leading to mutual education, good communication, and ease of referrals. With division counselors, counseling becomes more realistic,and thorough and the central student personnel staff has better communication with both faculty and students. Group meetings have also been used by faculty advisors.

The faculty team from Delta College (Michigan),[22] after their study of programs at other community-junior colleges in the nation, made the following recommendations for modification of their present faculty advisory system: advisors keep folder on each student with all pertinent information, advise only in one area for students in their own fields, and 25 students per advisor should be the maximum with five for new faculty who will be provided some training. Alternatives to the present system to be considered were: hiring additional professional counselors to do all advising, have one person in each division to do all the advising, use faculty members only in the special occupational areas, and recruit part-time advisors from retired professional people in the area.

Counseling for Transfer

In its Guidelines for Improving Articulation Between Junior and Senior Colleges,[25] the Joint Committee on Junior and Senior Colleges has answered the question of what should be done to improve the academic advising of transfer students with this statement:

> More attention should be focused on the needs of the transfer students for improved advising particularly in the senior institutions.
>
> a. Transfer students should be assigned an academic adviser no later than the time of their first registration in the senior institution.
> b. Information should be supplied to the advisors of transfer students to acquaint them with the (community-)junior college.

Whenever possible, advisers should be selected who are interested in serving in this capacity, who are willing to become familiar with (community-)junior college programs, and who accept the (community-)junior college as a partner in higher education.

c. Advisers in the (community-)junior college should become better informed about the progress made by their former students in the various senior colleges. They should keep up-to-date about programs, requirements, standards, and other matters of concern to their transfer advisees.[25]

Counselor and Teacher in the Recruitment of Industrial Education Teachers

Since the prospective industrial education teacher is both part of the general student body and particularly of the group in occupational programs, all that has been said on guidance and counseling is applicable to him. Since he must become interested in both an industrial area and teaching, he will be helped by improvement of the image of vocational education, of any raising of the status of vocational teachers, by an increase in counselor knowledge and skill in the occupational areas, and by the problems of both realistic information on occupations and of information on college programs. There is very little literature specifically on the prospective teacher, and most of this is concerned with the great need for such teachers and means for recruiting such students.

Ressler[26] in a study of recruitment of industrial arts teachers in Ohio found that about two-thirds of the industrial arts majors in Ohio colleges were influenced,to a large degree,by industrial arts teachers. It is the industrial arts teacher who exerts by far the most influence in recruiting these students into teaching; while parents, friends, and counselors have far less influence. The effective industrial arts recruiter teacher differed from other teachers by being older (one-third were over 50), by having more teaching experience in the same field (one-third had 20 years or more), and by holding a permanent teaching certificate. He also was more "professionally minded"[26] and had somewhat closer contacts with senior institutions.

Two teachers have suggested ideas for what the teacher can do to make up for deficiencies in vocational counseling in his school. Both teachers state that the initiative must come from the teacher. Odell[27] states that, while the counselor may be ignorant in the occupational areas and by background emphasis in his training be unsuited to occupational counseling, most high school counselors are already overworked. They do not have time to keep in touch with occupational and labor-market conditions or to establish and maintain contact with employers, unions,and community agencies; and neither time, knowledge, or money to maintain an up-to-date file on occupational information. The teacher must take this responsibility. He can present material to his classes in such a way that there is exploration of occupational families; he can teach students to find their own information by making use of industries in the area. Other departments may become involved in cooperative projects. The teacher can organize a club, such as the pep club where members can learn a great deal about the world of work. The teacher can take part in community organizations and talk to parents and others.

Walgren[28] would involve the counselor by using every possible means to educate him and then keep him up to date. He would start by inviting the counselor to visit his department and classes, explain programs and goals, and discuss students with him. He would invite the counselor to departmental meetings when discussing course content for various types of learners or course changes. A member of the department should be on the school guidance committee and, besides impressing on them the importance of industrial education, should keep them supplied with pertinent material. When the guidance counselor seems to have learned enough, ask him to speak to PTA groups, service clubs, etc.

Spence[29] also discusses the role of the industrial arts teacher in recruiting. As an example, he discusses one high school in which the teachers cooperatively prepared a one-period presentation giving an introduction to teaching as a career, the industrial arts teacher's job, training, and satisfaction of teaching. Students were surprised at the salary, opportunities, and the training required which made them realize that industrial arts teachers compared favorably with other teachers. Spence also polled industrial education departments at senior institutions on their recruiting methods. The methods are listed in the order of the number using them: send faculty to high school career days, mail brochures to high school industrial arts teachers, participate in high school seniors' visitation day to campus, mail brochures to counselors, visit with entering freshmen or non-majors, hold special on-campus meetings for high school seniors interested in industrial arts, scholarships for freshmen industrial arts majors, on campus "craftsmen's fairs,"[29] faculty visits to high school counselors and teachers, and newspaper and radio announcements. Those in the field must make known to high school and community-junior college students and parents what challenges and rewards they can expect. "We must tell them why we are teachers. However, recruiting must be selective to get the type of people needed; forcing a choice to teach is no solution."[29]

Much of what Blocker,[14] Harris,[14] and others have said about guidance materials in occupational fields needed by the high school and community-junior college counselor applied equally to the career of industrial education teaching. Certainly, the occupational information will be needed as the student must decide on both an occupational area and a teaching career.

Information needed from the senior institution would be similar to that stated by Banfield[12] (Report of the Annual President's Institute) and Knoell and Medsker,[16] in their study of the transfer student, as being needed by the community-junior college: requirements for transfer and degrees, full financial information (including realistic costs, scholarships, and job possibilities), housing and student activities, guidance services, college courses, equivalency sheets or cross-description of courses, reports of the progress of their students, newsletters giving facts about changes, conferences, research of value, etc.

Washington State University[30] sends a bulletin to the community-junior college which explains in detail requirements for admission,grades needed, credits accepted, housing, application procedures, visitation programs, and general graduation requirements. All courses from every community-junior college acceptable toward meeting requirements are listed, followed by specific information for each department with discussions of its program and requirements and help for transfer students on what to take if the community-junior college does not offer equivalent courses. Courses at Washington State are listed by departments with their equivalents at each community-junior college.

Both the high school and the community-junior college counselor should have informational material describing the various types of teachers--industrial arts, trade and industrial, and technical--what and where they teach, training required, opportunities, and intangible rewards of teaching and possibly statements from teachers. Counselors should also be given some information on the aptitudes, abilities, and interests related to the career. They should also have information that can be given to parents or presented at career meetings or put on the bulletin board.

From what has been shown about the counselor's ignorance of much of the broad field of occupations, it is doubtful if he knows much about industrial education teaching. Since he is probably overworked, material sent through the mail would not make as much impression as material presented at a meeting or during a visit from faculty, counselors, and students. Teachers at the institution being visited should also be involved and should be made aware of the teacher demand as they may be more successful recruiters than the counselors. Community-junior colleges should keep high schools supplied with full information on courses and of those of value to the potential teacher.

The community-junior college counselor should be informed about the programs in industrial teacher education at several senior institutions and know the differences in the courses they offer, their specialities and emphasis so that he can help the student select the school best for him. To increase the impact of the information and ease in utilizing it, material giving full information on college, departmental, and state requirements; offerings; suggested programs; etc.; should probably be presented separately from the general catalog. It would also be easier to keep it up to date.

Knoell and Medsker [31,32] have discussed the value of visits to the transfer institution in the spring and meeting with the faculty and counselors. A visiting day of community-junior college students who had already planned on teaching and those who might become interested would provide opportunity to inspect shops, laboratories, and other facilities; see what students were doing, and meet with teachers and the departmental counselor, if there is one.

Recent newspaper campaigns promoting the community-junior college may have left potential students with unrealistic expectations. The counselor should make students aware of lack of buildings and facilities for the number of students, state of flux, difficulty of identifying with a commuter school, possibility of poor teaching or inadequate courses because of problems of acquiring good staff, staff that are overworked and do not have sufficient time for lesson preparation, and problems when they transfer if their preparation has been inadequate. They should also be aware of the status problem; that people still consider a community-junior college a lower status institution and that within the college technical, vocational, and terminal program students have a lower status than transfer students.

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Admission and Transfer

Problems Related to Transfer Students

The transfer of students from community-junior college to senior institution involves problems, people, and procedures. It involves the student in his choice of program, his degree goals, his economic and academic resources, and the characteristics and requirements of the colleges to which he might be admitted. It involves problems of the acceptance of transfer credit; coordination of methods and materials in teaching; coordination of courses, grading standards, and counseling; and exchange of information to facilitate adjustment to the transfer institution. Some of the specific problems are: which type of admission standard is most appropriate--admission of all students with a C-average or some selective standard? Should test scores be considered in admission? How can faculty and institutional autonomy be preserved and flexibility be provided for in a highly coordinated system of community-junior college and senior institutions, and how can the senior institutions be prevented from usurping the right of decision in instructional matters? What priority should be established when enrollments must be restricted? What kind of planning can be done by all segments of higher education to make sure that high school graduates attend the type of college which is best suited to their needs and abilities, and to preserve the right of students to transfer into the upper division to continue their degree programs with a minimum loss of time and credit?

The questions then arise as to who will do the articulating, who will determine the policies, to whom will the responsibility for credit evaluation be assigned, and what is the effect of various forms of articulation machinery and procedures? Knoell and Medsker asked these questions in the report of their comprehensive national study, _Articulation Between Two-Year and Four-Year Colleges_,[1] in studying the success of the transfer students between 1960 and 1964 in the ten states with the greatest number of transfer students.

Success After Transfer

The students who have the grestest chance for success in transferring from community-junior college to senior institutions according to Knoell and Medsker[1] are those who have decided on the particular transfer institution by the end of their freshman year. They should consider in relation to their own aims and programs the general characteristics of the college, its provisions for housing and other student services, the nature of its student body, requirements as to specific courses and other particulars about the curriculum, how well students from their community-junior college (and particularly in their area of specializations) have done, grade point averages and other requirements for admission, and whether a drop in grades at that college will be apt to disqualify them. Knoell and Medsker also concluded that most students could be successful if they would select institutions and majors which are appropriate to their abilities and prior achievement. In every state there is probably at least one college where even the student with a C-average could succeed. The authors found that chances for success varied with the type of institution, and with the state. Students with fairly low community-junior college averages were less likely to succeed at major state senior institutions and more likely to succeed in colleges placing major emphasis on the selection of teachers. There was wide variation, however, within each group of schools. Success in an individual senior institution seems to be related to the quality of the native students, the size and complexity of the institution, and its philosophy concerning undergraduate instruction and advisement. A few of the factors causing state differences were the extent to which opportunity to transfer was restricted to students with above-average grades; the degree of diversified offerings in specialized fields; and the development of good guidance and articulation programs involving the various levels of secondary and higher education. In New York State, there was a lack of opportunity to transfer outside of the teachers' colleges and in engineering, but many students did transfer out of state. Illinois suffered from a limited diversification in its public institutions with most of the curricula in advanced technical and applied fields concentrated at the University of Illinois, where the average student had less probability of success. In Georgia, choice was restricted because there was little curricular overlap between senior institutions. Michigan had a record of success with its transfer students. Although the University of Michigan was selective in admitting transfer students, other senior institutions with a diversity of specialized programs admitted all C-average transfer students.

For industrial education students, the choice of schools is more limited because they must find one that not only prepares teachers but offers work in their areas of specialization. There is a general trend toward diversification in both community-junior colleges and senior institutions. In some specific instances, however, the high cost of laboratories and equipment and a shortage of qualified faculty may result in only one institution in the state offering the specific program the student desires. It is important for the student to know whether his technical courses and his science and mathematics background have prepared him adequately for the senior institution's program. He also needs to know what technical courses will be accepted for credit.

Knoell and Medsker concluded in their 1965 study that the optimum time for transfer is at the end of two years, provided the student can then transfer with full upper-division standing. In their study, attrition rates were higher, grades lower, and the time requirements for graduation greater for students who transferred earlier or who were required to take lower division courses after transfer to the senior institution. Only 55 percent of the group transferring with less than junior standing graduated, compared with 75 percent for those who transferred with junior standing. Yet, the transfer students with only one year in a community-junior college had been fairly good students while there and should have made better records at the senior institutions.

> Despite restrictions on the amount of credit which can be transferred......most students should be urged to remain in junior college until they can transfer with full upper division standing, with all lower division requirements met, and with various prerequisites satisfied.[2]

Exceptions should be encouraged only when the community-junior college does not offer the necessary lower division prerequisite courses.

Transfer and Admission Policies

White[3] investigated the use of high school records and of tests by 166 colleges and universities in transfer admission policies: Only 14 percent (all private liberal arts colleges) considered the high school record important, 38 percent gave it no weight, and the others considered it but put emphasis on a satisfactory community-junior college record. Knoell and Medsker (1965)[2] determined that community-junior college grades are more highly related than high school grades to success after transfer. Of the schools surveyed by White, 50 percent did not require entrance examinations for transfer students, 40 percent did, and 10 percent replied that it depended on the student's record. Knoell and Medsker (1965) also noted that if community-junior college grades are used to screen applicants for transfer, test scores should not be required for admission. A variety of tests were used by the institutions "often without any clearly defined purpose in mind in doing so."[2] School records have been shown to be a better predictor than test scores. Another reason to question the efficacy of test scores for transfer students is that these students are moving into their major fields and into courses in and for which they have their greatest interest and aptitude.

Testing for Guidance and Placement

Tests can be used validly for a number of functions in guidance and placement. Among these functions are the screening of applicants for advanced standing, determination of proficiency in English and basic skills, validation of credit for community-junior college courses when the community-junior college program has been different from that of the senior institution, the placement of students at appropriate levels in their major fields, and validation of credit for vocational courses taken in community-junior college terminal programs.

The present program under way by the Educational Testing Service of Princeton, New Jersey, to develop a comprehensive test battery specifically for community-junior colleges should prove useful in performing a number of these functions. The College Entrance Examination Board has established a Council on College-Level Examinations to develop a nation-wide program of placement and credit by examination. One of its aims has been to expand opportunity for transfer students.

Acceptance of Transfer Credits and Grades

The senior institutions participating in the Knoell and Medsker study (1964a)[1] were fairly liberal in their policies for accepting transfer credit, although some placed restrictions on the amount that could be used to meet degree requirements. This was usually half of the total number of credits needed. Some schools specify two-years' residence at the senior institution. California state colleges accept 70 hours of community-junior college credit. In Florida, a state ruling specifies that,if the student is certified by the community-junior college as having met all lower division requirements, he must be admitted with full upper-division standing. This ruling applies only to general education. In 1960, the year of transfer for students involved in the Knoell and Medsker study, the amount of credit which could be transferred ranged from 60 to 72 hours.

In White's[3] study of transfer policies of 166 colleges and universities, 61 percent accepted the equivalent of two years' work; the others more. The replies to White's questionnaire showed only five senior institutions accepting a grade-point average below 2.0. Eighty-seven required a 2.0 (C) average and 32 required a 3.0 (B) average.

Knoell and Medsker found a great variety in admission standards in 1960. The prevailing practice was that of admitting all students with a "C" average, but some institutions admitted those with less than a C average. By 1964 a number of institutions had raised requirements to a C+ average with exceptions made for certain students. Some raised required grade-point averages for certain classes of students, such as those with poor high school records or those transferring with less than two years in the community-junior college.

Differences in grading standards at community-junior colleges and senior institutions and the fact that there is usually a drop in the grade-point average at the end of the first semester after transfer make it desirable for senior institutions to study their transfer students to ascertain the grade-point differential for each community-junior college. Each community-junior college should also calculate the grade-point differential for each senior institution to which it ordinarily sends transfer students. Hills (1965b)[4] suggests that each senior institution analyze its experience with transfer students from specific institutions and adjust the grade-point average required to allow for the drop after transfer. Bashaw[5] has developed a central prediction system operated by computer to predict success from any community-junior college to any senior institution using grade-point differentials, weights for different majors, twelfth grade test scores, and community-junior college grades.

Most senior institutions, while recording community-junior college grades, do not use them in computing grade-point averages required at the senior institutions. Many students complain about this, particularly as it affects retention policies. If their grade-point averages, the first semester, drop below "C," their community-junior college grades cannot be used to raise the level. Knoell and Medsker[1] concluded that the fairness of this practice needs further consideration.

Most institutions have an open door for transfer students with a C-average, but the policy may undergo some alterations as space becomes more limited or as institutions gain more experience with transfer students. At the time of the Knoell and Medsker[2] study, all institutions had open-door policies with the exception of a few private colleges and the Universities of California and Michigan. The University of California required students not eligible as freshmen to present a "C+" average and to complete 56 units before transfer. Under the selective policy of the University of Michigan, consideration was given to high school and college grades and other individual characteristics.

More than half of the students studied by Knoell and Medsker (1964)[6] lost some credits in transferring but fewer than 15 percent viewed the loss as serious. The major reason for loss of credit was the limitation placed by the senior institution on the amount of community-junior credit acceptable for fulfilling degree requirements--usually about half the total program. Another important reason was that more than 20 percent of the students received poor or failing grades before transfer, and some senior institutions did not accept courses with "D" grades. Also, community-junior college courses for remedial purposes to satisfy high school deficiencies were not accepted. Often all credits would be accepted and entered on the record, but some of them would not be counted toward a degree. Actual evaluation, particularly in professional courses, was not made until after the student was in residence.

Norman C. Harris (See Richardson.) stated that, frequently, graduates of associate degree programs in occupational fields, after working awhile, desire to continue their education at senior institutions. Successful transfer for such students, however, is not usually easy. One major reason is that many senior institutions will not accept courses taken in occupational (terminal) programs. In discussing the problems faced by these students, Harris said:

> Most certainly I do not recommend sacrificing the kinds of experiences which really prepare for middle manpower jobs just for the sake of some (possible) college credits toward a baccalaureate degree. All we can hope for here (and we can work for it too) is an increased flexibility on the part of universities and four-year colleges along with a willingness to evaluate students and courses on their individual merits rather than on a transfer versus terminal basis. It seems to me a matter which can be solved at the state level by liaison committees working for better understanding between junior college and four-year college.[7]

Knoell and Medsker (1965)[2] suggest that we stop calling programs terminal or transfer. As technology expands, it may be desirable to build on community-junior college occupational programs.

A survey by Auburn University (Alabama)[8] to help determine its own policy was made with respect to acceptance of transfer credit from terminal-technical programs in community-junior colleges. Replies from 17 state universities and land-grand schools indicated that nine would accept no credit, four accepted limited credit validated by examinations, one accepted credit applicable to the students' fields at the university, and three accepted university parallel courses but not vocational courses.

Purtzer,[9] using questionnaires sent to the heads of industrial arts departments in 48 colleges in the West and Midwest, found only one school that would not allow credit for technical courses in accredited community-junior colleges. Forty schools stated that they would allow credit up to two full years' work. For courses from a non-collegiate technical school, five schools would allow credit and 18 would judge each case individually. Nine schools would allow credit for courses in a military service school, with 19 more saying they would consider the individual case. Twenty schools would not allow credit for work experience equivalent to a technical course; other schools allowed credit, sometimes validated by examination or waived the course but granted no credit.

Lauda[10] surveyed 201 institutions with industrial teacher education departments to determine their acceptance of work experience. The 49 institutions that granted credit for trade competence were, for the most part, large ones. Thirty-nine others were planning to grant credit. The credit was usually validated by examination and was granted only to full-time students. The maximum allowed was 20, and there were great variations in the procedures for determining credit.

A survey by Nathaniel Smith[11] of "technical" courses ranging from business to agriculture in more than half of the public community-junior colleges in the nation identified major problems as lack of adequate vocational guidance, parent opposition (again related to counseling), and loss of credit when transferring. No credit or only partial credit was accepted by many transfer institutions. Fifty-three colleges had agreements to have partial credit accepted, and 43 had agreements that allowed full credit.

Graduates of two-year technician programs can enter programs at Oklahoma State University without loss of credit, and graduates of two-year engineering/technician programs find it easy to continue in New York State. Ferris State College in Michigan has a degree program involving minimum loss of credit. The University of Florida and the University of Illinois have degree programs for teachers that articulate with community-junior college technology programs. There are other schools that accept these courses, particularly if they are appropriate to the students' fields. Purdue University (Indiana) recruits from its own two-year technical programs for prospective technical teachers to continue on to their baccalaureate degrees.

Counseling for Transfer

Two tools used by counselor and student in planning for transfer are college catalogs and equivalency lists. The equivalency lists give community-junior college courses in specific colleges and their equivalents in one or more senior institutions. They make it possible for the community-junior college student to know what courses he should take if he wants to be certain of their transfer status. They also make almost automatic the checking by senior institutions of acceptable transfer credit.

The agreements between the community-junior colleges of the Los Angeles area and the University of California at Los Angeles and other senior institutions are of this type. (See Los Angeles City Schools.)[12] Community-junior college courses with their equivalents in the senior institutions are listed by subject field; other courses acceptable for transfer and lower-division requirements are also listed. The state of Washington lists every community-junior college for every senior institution by major equivalent courses, alternative acceptable courses if the community-junior college does not have equivalents, degree requirements, major requirements, and transfer information. This document is updated annually and sent to all counselors and admissions officers. (See Berry.)[13] Usually, these statements protect the student against sudden changes by stipulating that the agreement in effect when he matriculated in community-junior college will remain applicable to him. If the student wants to take courses not on the list, however, the counselor may discourage him because of the difficulty in working out special cases. The inadequacy of many catalogs and the difficulty of obtaining specific and up-to-date information from them have been commented upon. Knoell and Medsker[1] several times mentioned the vagueness of catalogs and the impossibility of obtaining factual information from some of them. Sometimes course descriptions are repeated year after year, and frequently the organization or exact coverage of the course is not clearly stated. Courses are listed which are not actually offered in the year the student plans to take them. Departmental or major requirements are not always clearly stated, and much of the general information about the college tends to paint a rather vague and, often, idealistic picture. Students have commented on the difficulty the community-junior college counselor had in working out programs from the catalog alone. One student in industrial arts remarked that nothing in the catalog indicated that the method of organizing material in his major was any different from his community-junior college courses, and he didn't know until he arrived on campus that he had a problem; he had to start his major all over again.

More exact information and better descriptions of requirements, possible, choices, etc., for the would-be industrial education teacher could well be given along with general information about the senior institution and its transfer and graduation requirements in a separate form that could be revised annually, if necessary, and sent to teachers, counselors, and students. One student remarked that when he was a senior, the counselor arranged for a joint conference with each student and his parents in which SAT and Iowa test results, interests, and career plans were discussed. He and his mother told the counselor that he would like to teach electronics.

The counselor confused it with industrial arts since it was in that department in high school. He looked through several catalogs without finding what the boy had in mind. Finally he told the boy, "You'd better ask your teacher how he got here."

Evaluation of Transfer Credits

The question of who in the senior institution does the evaluating varies with the institution. Purtzer,[9] in a survey of admission and transfer policies at 48 Midwestern and Western colleges, found wide divergence among them. General policies might be determined by the governing body, the president, dean of the college, registrar, scholarship committee, or various other committees, and, in a few cases, involve department heads. Final ruling on assignment of credit and on special cases might be made by the dean, the registrar, the department head, or a committee. A fairly common practice is for the admissions officer to pass on general education courses with the department head deciding on the value of courses in the student's major area. Tests for the validation of certain credits are usually constructed by the department or one of the staff. This evaluation could be done before the student transfers so that he might be certain of his program but is frequently delayed until he is in residence.

Ralph Banfield, from the admissions office of the University of Michigan, at the 1965 Conference of Community College Presidents (See Mealey.)[14] described practices at the University. Transfer students are admitted as far as facilities are available with preference given to those with associate degrees in good academic and personal standing. Each unit has its own specific requirements and may make some decisions concerning students in its area. Each student is considered separately on the basis of his own record, his abilities, and the quality of instruction at the institution he attended. Evaluation of credits is flexible, but they must be appropriate to his course and have a grade of "C," although certain units have additional restrictions of their own. When courses do not parallel those at the University, adjustments may be made. Pre-professional courses are not evaluated until after the student is on campus. Grades are not recorded.

Articulation Between Community-Junior and Senior Institutions

Banfield[14] described methods of articulation at the University of Michigan which involved annual visits of administration, faculty, and counselors to and from the University and the community-junior colleges plus an annual workshop of personnel from all two- and four-year institutions to discuss problems.

Byron Johnson gives this advice on articulation with senior institutions to those starting community-junior colleges:

> Visit neighboring senior institutions to arrange for transfer of courses, submit to senior institutions lists and descriptions of courses for rulings on their transfer, and have faculty members confer with faculty in their fields at senior institutions. Encourage the establishment of statewide committees representative of junior and senior colleges to consider problems of liaison. Counselors should confer with admissions officers at senior colleges and prepare a handbook on procedures and acceptability of courses. Articulation may be between particular programs on two levels, between two colleges, among groups of institutions, or at the state level.[15]

With the tremendous growth in the number and size of community-junior colleges, their increasing share of lower-division students, the diversion of transfer students in greater number to all senior institutions (each with differing characteristics, requirements, and programs), and the greater diversity of offerings and curriculum experimentation at both levels, problems of articulation become more complex with an even greater load of work.

Who should do the articulating?

> Examples could be cited where registrars and admissions officers have assumed major responsibility for articulation among colleges. Special staff members for college relations are

> being added to admissions staffs, and it seems likely that an even greater amount of articulation activity will be centered in that office. Elsewhere articulation may be the concern of student personnel groups, particularly counselors. In some fields faculty members work on articulation problems, often through their professional associations. In Florida and California with extensive statewide articulation programs administrators at a fairly high level are involved, particularly in the planning and coordinating phases of state programs.[1]

After study, agreements must be proposed, ratified, and then carried out. Involved may be high schools, two- and four-year public and private colleges, state departments of education, professional associations, coordinating agencies, administrators and faculty, and regional accrediting associations. When, as in California, the numbers of institutions become too large, an effective form of representation must be devised. The question of how far articulation can be voluntary and yet be effective and when it should be compulsory or a matter of state ruling after discussion is a point for debate. Mechanics for communication of agreements to all colleges and concerned personnel are often inadequate. Knoell and Medsker[1] mention that agreements are sometimes made by administrators who know little about and have no responsibility for admissions and evaluation. Curriculum agreements may be reached without participation by or communication to faculty and advisors. Problems which are the concern of pairs of colleges should not be decided at the state level, nor should state decisions stop pairs or groups of colleges from working on their own programs.

Too often, new state master plans emphasize the setting up of community-junior colleges without making adequate plans for absorbing the increased number of transfer students in senior institutions. State organization and machinery influence the transfer situation. Where area post-high technical schools are organized, students from these schools may have a problem if they wish to continue. In some states, as in Pennsylvania until recently, the two-year institutions are branches of one or more universities, and articulation is comparatively easy. In Georgia, all public institutions are under a simple governing board, and articulation is accomplished by its administrative and academic committees. Faculty from all institutions meet to work on subject-matter areas. Testing, guidance, scholarship standards, personnel, and education policy are determined by administrative committees. Guidance is coordinated for all colleges with information issued from the state on characteristics of students at each institution, financial aids, and programs of study as well as reports of tests and research. The pre-college testing and guidance program is statewide. Georgia, however, had not solved its articulation because of the limited offerings of its senior institutions. Two-year technical students could transfer only to the Georgia Institute of Technology, where they made a rather poor showing in the Knoell-Medsker study.[2]

Florida's community-junior colleges are part of the county school system but are under control of the state. The state has an extensive and well organized set of machinery for coordinating education at all levels. Articulation between community-junior and senior institutions (once agreement has been reached) is statewide. The autonomy of the community-junior college is preserved by the specification that, if the college certifies the student has completed all of its own two-year requirements in general education with a grade of "C," he must automatically be accepted with full junior standing and not be required to enroll in any lower-division courses after transfer. The community-junior colleges must publish their programs and they must include a certain number of credits in specified subjects, such as communications, mathematics, humanities, and social and natural sciences. The private universities are also parties to this agreement. (Florida State Department of Education, 1966)[16] Texas, Illinois, Michigan, and New York have master plans which provide for the development of community-junior colleges and for formally constituted state-level agencies to coordinate the various educational levels. (For Texas, see Colvert.)[17]

The matter of what community-junior college courses are acceptable for transfer credit or for credit toward graduation requirements is the subject of controversy. Specification by the senior institution of community-junior college courses that will be accepted and of those acceptable for certain majors is considered by many to make the system too rigid, to make change more difficult, and to limit the traditional commitment of the community-junior college to innovate and experiment. Many community-junior colleges have planned their transfer programs to conform to the curriculum of the state senior institutions; but as more students transfer to other senior institutions with a wide variety of curriculums, requirements, and instructional methods, it becomes impossible for a community-junior college to organize its courses to articulate automatically with all of them.

In California, the community-junior colleges argued for automatic credit for general education courses taken in community-junior college when students transfer to the state university or the state colleges with across-the-board junior standing for their graduates. (Kintzer)[18] This arrangement would be similar to the Florida plan where community-junior college students who have completed the general education requirements of their own colleges are to be accepted by other state institutions. In California, the position of the senior institutions is that evaluation of community-junior college courses and assignment of credit toward degrees are prerogatives of their institutions and faculties and should, therefore, determine their own curriculums and requirements. They fear that, if the community-junior colleges determine their own requirements, students may be inadequately prepared. The present system of articulation is complex and, often, slow. Community-junior colleges must submit proposed courses to the office of relations with schools which, in turn, submits them to the state university for approval. The colleges may also need to obtain official approval from other colleges or department heads. The "Articulation Conference" of representatives of high schools and colleges informally supervises the process from high school through graduate school. It holds conferences in subject fields and works for agreement. The case presented by the community-junior colleges is that changes may be made in university courses before they are aware of them and that some decisions rest on the arbitrary and capricious whims of senior institution faculties.

The right of faculties to set curriculums should apply equally to the community-junior colleges. They are equal partners. They enroll more than two-thirds of all lower-division students, and the success of their transfer students is proof enough that they should determine their own general education patterns. They should not be required to submit course outlines for validation by the senior institutions. The present need to conform hinders experimentation, innovation, and the designing of courses appropriate to student needs.

Recommendations for the Solution of Transfer Student Problems

In the Guidelines for Improving Articulation Between Junior and Senior Colleges,[18] the Joint Committee on Junior and Senior Colleges made the following recommendations:

1. Open door for students with C-average; selection, when space is limited, of those most likely to succeed; and counseling to help students select colleges most appropriate for them. Students should be encouraged to finish all lower-division work before transfer.
2. The community-junior college should count more than the high school record and test scores in determining admission.
3. Senior institution requirements as to grade-point averages, courses, and majors should be clearly stated so that community-junior colleges will know whether students are eligible.
4. Grade-point differentials between community-junior and senior institutions may serve a useful function but should not be used to determine admissions unless transferring students experience a high attrition rate.
5. In evaluating a transferring student's credit, he should be informed if the first evaluation is only a gross one, and a precise evaluation should be made as soon as possible. All community-junior college courses should be entered on his record. Completion of an associate degree transfer program should guarantee upper-division standing.
6. No limit should be placed on the amount of transfer credit accepted. If the senior institution has a residence requirement or unit requirements for the degree, these requirements should not exceed half the credits in the four-year program.

7. D-grades should be handled as they are for native students. A course with a "D" grade may be repeated without credit if it is to the student's advantage.

8. Transfer students should not be required to take examinations to validate courses parallel with those of the senior institution. Tests may be used, however, for placement or for validating or waiving requirements for courses in terminal or vocational programs, courses not parallel to those of the senior institution, or achievement through out-of-school experience.

9. There should be agreement in writing on courses accepted for credit, and lists should be kept up to date.

10. Community-junior college students should know what high school deficiencies must be made up before transfer.

11. In a period of change, transfer students should be permitted to follow requirements in effect when they entered as freshmen. Changes should be communicated as soon as possible.

12. There should be enough flexibility that students diverted from their first choices will not be delayed by differing requirements in completing their degrees.

13. Community-junior and senior institutions should be encouraged to experiment, but transfer students should not be penalized by such experimentation through loss of time or credit.

14. Articulation efforts should involve the types of personnel who deal most closely with the problems under consideration. Appropriate representation should be secured from all groups concerned, and administrators at policymaking levels must be involved in approving agreements. When the number of institutions is too great for direct representation, there should be rotation of responsibility and effective communication.

15. Voluntary agreement is preferable.

16. Various procedure may be needed--standing or special committees, state and regional conferences, and inter-institutional visits. Activities may be local, state, or national according to the nature of the problem.

17. Communication can be by visits, conferences, committee activity, dissemination of information of value, and effective college publications.

18. Articulation machinery should be flexible and responsive to changing situations.

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Students

General Characteristics

In many respects, the students in vocational-industrial and technical curriculums are similar to the general community-junior college student body of which there have been a number of studies ranging from institutional to those on a national scale using good sampling techniques. Medsker (See, the McConnell report on Junior College Student Personnel Programs: Appraisal and Development.)[1] has summarized the results of previous research, including his own, in a profile of the community-junior college student which illustrates the heterogeneity and variety of problems to be found in this population. In 1962, fewer than half of the students were full time, but two-thirds of these were freshmen. Men greatly outnumbered women; half of them were under 20, but 16 percent were over 30. Ethnic minorities entered the community-junior college, but few completed requirements for transfer. Closely approximating the pattern of the general high school population, over half the students' fathers had high school educations and most worked in skilled occupations, semiprofessional occupations, or small businesses. On the whole, except in California and Florida, those from high socioeconomic levels did not enter community-junior colleges. In California, many students eligible for a senior institution attended a community-junior college; otherwise, the freshmen on the average were lower in academic potential than those entering senior institutions. Only 16 percent claimed to read a lot, and almost one-third were deficient in reading skills.

A number of local studies are agreed that at least a third of the freshmen need remedial work in skill subjects. (There were no national studies on this subject.) Transfer students on the whole have the same aptitudes as native students; but measured by academic achievement, the community-junior college students rate lower. Students enroll in community-junior college because of the low cost, the closeness to home, the chance to work while attending, or because they were not accepted by a senior institution. Upon entrance, 75 percent of community-junior college students say they are transfer students. In California, 53 percent of the low ability students were found to be enrolled in transfer programs. Less than half of all those enrolled in such programs actually transferred. Only 43 percent of the freshmen stated that college was important in their value schemes, and they reported less discussion of college with parents than did students who entered senior institutions. Occupational choices of community-junior college students appear to represent their desires to be middle-class citizens. The men are most attracted to business and engineering; the women to teaching, secretarial work, and sales work. Even among lower ability groups, half plan for semiprofessional positions or higher, and only seven percent for skilled occupations. High ability students are more likely to have made an occupational choice. About 20 percent are completely undecided and 50 percent are uncertain. Of those who are sure of their choices at entrance, many make a change.

A nationwide survey revealed that two-thirds of the students were earning some of their expenses. One-fourth were working 20 hours a week or more at jobs rarely related to their major fields. Community-junior college students were found to have less academic commitment than those entering senior institutions. Using the Omnibus Personality Inventory, some personality differences were found when comparing both types of freshmen--those in community-junior colleges being lower in social maturity, more conventional, less independent, and more authoritarian. [Studies used in this summary are listed in the Bibliography under the individual author's names--Berg[2], Darley[3], Flanagan[4], Florida State Department of Education[5], Knoell and Medsker (1964a[6] and b[7]), Medsker and Trent[8], and Tillery[9].]

Cooley[10], in a follow-up study using data from 44,000 high school youth who had originally taken a two-day test battery for Project Talent, used two types of variables to compare community-junior college students with senior institution students and non-college students--selected ability measures and family socioeconomic cultural environment measures. On every ability measure there were differences between the groups with some tendency for community-junior college students to be more like non-college students, but there were greater differences between the sexes. The mathematical scale seemed most predictive. On socioeconomic measures the sexes were not differentiated, and the community-junior college group tended to be more like the senior college group. Father's job, mother's education, and having one's own room or desk seemed most predictive, but the author felt not enough is known yet about socioeconomic measures to draw conclusions as to the influence of environment on the decision of whether or not to attend college.

Panos[11], in a pilot study, collected data from 6,860 entering freshmen at seven community-junior colleges which were representative of different types of colleges. On all measures the range among the different colleges was considerable, showing the variation that exists among community-junior colleges with regard to a variety of student characteristics. While over 70 percent were 18 or younger, there were larger percentages of older freshmen students than in senior institutions. The modal family income was in the $10,000 to $14,999 bracket, but almost five percent reported less than $4,000. The fathers of 44.9 percent and the mothers of 35.5 percent had received at least some college education. Almost 60 percent were from Protestant backgrounds, 26.5 percent from Roman Catholic backgrounds. Approximately 93 percent were Caucasian, and slightly less than one percent were Negro. Eighty-nine percent were from public high schools. The modal high school grade was "C" compared to "B" for freshmen in senior institutions. (This reflects the opportunity offered by the community-junior colleges to students not accepted at senior institutions.) There is, however, a wide range among colleges of both types. The educational aspirations of the community-junior college students may be unrealistically high as about three-fourths planned to earn baccalaureate degrees and half of these intended to go on to graduate work. Only nine percent of the group were undecided about their majors. About one-fifth were in business, 4.5 percent in technical fields, and about one-fifth in a variety of special fields, such as police science, forestry, and air conditioning. A considerable number had taken active parts in high school activities, although the proportion of those receiving recognition was less than for freshmen in the senior institutions. Self-ratings on personal traits indicated a number of college subtypes and again showed a wide range among colleges.

A study by Metcalf[12] of age, sex, study loads, residency, commuting distance, previous education, and program gives data for 30,951 students, both full and part time, in 15 Washington community-junior colleges. Academic students comprised 87.4 percent of the group, vocational 12.3 percent, and adult 0.3 percent. The great majority planned to transfer.

Bossone[13] states the implications for college administrators and teachers of the data on community-junior college students. A knowledge of the statistics is not enough. Teachers must be trained to understand and meet the problems, both psychological and academic, particularly of the large group from lower socioeconomic backgrounds. These students have often been accustomed to less privacy, have greater sympathy for the industrial rather than the professional group, and are apt to be suspicious of authority. They are accustomed to people dissatisfied with work and pay, live more in the present, and prefer security to self-expression. Psychological problems are reflected in insecurity, occupational and status anxiety, and lack of social skills. Language skills are often deficient and remedial work is needed. Good English is not spoken at home, television replaces books, and there is a lack of understanding of academic and cultural pursuits.

There are many institutional studies of the community-junior college student. Thomson[14] reported in 1967 that those studies received at the ERIC Junior College Clearinghouse were of value only to the particular institutions, usually being based on entire classes or student bodies with no sampling procedures and no adequate procedures for handling data usually obtained from records and involving little analysis. Such research should be improved so that it can have greater value to the entire field. Colleges should develop common variables and correct sampling and coding procedures to permit the development of normative studies.

Some studies have been made that attempt to differentiate students in vocational programs from other students. Stewart[15], using parts of the Omnibus Personality Inventory and an Interest Assessment Scale, analyzed personality variables of male and female students at a California community-junior college that specialized in trade and vocational programs. Noncognitive variables include risk taking attitudes, impulse expression, estheticism, abstraction, and sources of life satisfaction. Both instruments differentiated between vocational students and non-vocational students at another community-junior college and a senior institution, between the sexes, and to some extent among major fields. Electronic technicians, for example, had lower scores than drafting students on adventure, order, influencing others, and estheticism; but they were high on abstract ideas. Students in machine technology and aeronautics were similar to electronic technicians except for written expression on which they were lower. It seems reasonable to conclude that there are psychological factors related to the choice of a vocational objective and even of a particular program in a community-junior college, but more exploration is needed before we can say what causes what.

Hakanson[16] studied 319 students from six community-junior colleges in the west and midwest in terminal occupational programs. Most of them had enrolled in the programs directly after high school graduation, and the majority of them (especially women) had taken programs in the same occupational fields in high school. Terminal students were in the middle and low socioeconomic levels and in the medium and low ranges in scholastic aptitude. Compared with all graduating high school seniors, there was overrepresentation of women of middle socioeconomic status and scholastic aptitude and men of low socioeconomic status and scholastic aptitude. Forty percent of the group completed their programs. Students of middle socioeconomic status were more likely to complete programs than those from either the high or low groups. Only 14 percent of those who dropped out of academic transfer programs changed to occupational programs, underscoring the need for better guidance services to help such students.

Several studies of industrial arts students and teachers at Colorado State College, all used for Ed.D. dissertations, (Nelson[17], Crist[18], Morgan[19], Monroe[20], Vacek[21], and Messman[22]) found that the Edwards Personal Preference Schedule differentiated between industrial arts students and teachers, as well as between both students and teachers and a normative group of college men. It also differentiated entering industrial arts freshmen from those with other majors. It did not differentiate, however, between class groups of students. The student population studied was male industrial arts majors at four senior institutions. The conclusions were that the test was an effective aid in guidance of freshmen in industrial arts and into the teaching of industrial arts, but that it could not be used as an instrument for predicting academic success in industrial arts. It was also found that the Edwards Personal Preference Schedule and the Minnesota Vocational Interest Inventory tended to show relationships between vocational interests and personality variables of industrial arts freshmen. Both industrial arts students and teachers differed from the normative group.

Larson[23] studied by questionnaire the characteristics of 297 students who had enrolled in Michigan community-junior college vocational-industrial or technical curricula in 1958-59. All were males. Thirty-four percent (101) of the group had graduated, 8 percent were still attending, 7 percent had transferred, 5 percent had accepted apprenticeships, 7 percent were in the military services, and 19 percent had taken jobs before finishing. Approximately three-fourths of the students started college between the ages of 17 and 20. Fifty-four percent were residents of the local districts, and three-fifths had fathers who worked at unskilled, semiskilled, or skilled jobs. Sixty-five percent reported a high school average of "C." Ten percent had previously attended another college. Work, financial assistance from parents, and personal savings were the means of financing their educations. Financial need was clearly shown in the work and attendance patterns. (Fifty-two percent worked on part-time jobs and 22 percent on full-time jobs while attending college.) Of those who graduated, 66 percent worked part time, and 17 percent worked on full-time jobs. Nearly one-half of the total group attended college at some time on a part-time basis. Of the graduates, 62 percent finished in two years. About 60 percent of the graduates had a college average of "C," and the other 40 percent a "B" average. Drafting and design was the curriculum most commonly found in the community-junior college offerings. Along with electricity, electronics, and other technology subjects; it was also considered most useful. English and mathematics were considered to be of value, but the opinion of most was that they needed revision. Thirty-one percent of the total group and 22 percent of the graduates believed that too much emphasis was placed on theory and that more time should be given to the development of hand and machine skills. Of the total student group, 27 percent thought a two-year program was too short. This would seem to indicate that the need for industrial training at the skilled level should not be forgotten in the push for more rigorous technician programs. Of the graduates, 72 percent found employment either in their home communities or the college area. Only half of the graduates and 35 percent of the total group were working at the jobs they had prepared for, but an additional number said that their college work had helped them in securing their jobs and might also help toward promotion. Sixty-eight percent of the graduates expressed a desire to take more courses.

A study of 30 graduates and 30 unsuccessful candidates in collegiate technical programs at Ferris State College in Michigan (Taylor, Lazotte, and Bondy)[24] differentiated the groups on the Strong Vocational Interest Blank administered when they were freshmen. Successful ones showed higher scores on architect, dentist, mathematics, physicist, engineer, aviator, carpenter, and policeman subscales. Unsuccessful ones were higher on forest services, personnel director, social science teacher, social worker, musician, sales manager, real estate, and life insurance sales. The differences were essentially those between "thing" orientation and "people" orientation.

McMahon calls attention to another aspect of the teacher trainees in industrial education:

> The 'student' body in the teacher-training division of Trade and Industrial Education is unlike any other. The members are, ideally, masters of a skilled trade, a condition resulting from years of work experience. They may be relatively young; they are more often quite mature adults. They may have some formal education beyond the high school, but they also may have entered the teaching field with only a high school diploma or its equivalent. Above all, they are individuals, accustomed to rely upon their own skills and abilities for any success which they have achieved. In many cases, they are basically non-verbal, pragmatic,

> practical, and determined to secure the greatest possible amount of usable material from the education for which they are paying. (See Center for Research and Leadership Development in Vocational and Technical Education, 1966.)[25]

This description is not universally applicable, but it does suggest a large group which must be considered in the planning of industrial teacher education programs.

There have been many studies of the transfer student and his problems at the senior institution. Two summaries of the research on the performance of community-junior college transfer students point out the main findings and the defects of most of these studies. Hills (1965b)[26] surveyed the research from 1922 to 1963; Roueche[27] reported on 24 studies received by the ERIC Junior College Clearinghouse through 1966. Conclusions drawn from the research indicate transfer shock in that grades will probably be lower in the first semester, although they may recover to some extent. Transfer students' grades are lower than those of native students, and the transfer students are less likely to graduate and take longer to do so than native students. The transfer students may have trouble if they transfer to major state senior institutions. Most of the studies are based on records, but they do not give insight into reasons for success or failure. Are transfer students different from native students in aptitudes or academic achievements? Is there a difference in grading standards? Do problems of articulation requiring extra lower-division courses cause the delay in graduating? Are there any implications for the adequacy of community-junior college programs?

Lee and Suslow[28] differentiated four groups of transfer students entering the University of California at Berkeley in 1961-62 on their community-junior college grade-point averages and found significant differences in their performances. A much higher percentage of the top group graduated and finished in four semesters. For each of the four groups, however, the University grade-point average was lower than the community-junior college average, and there was a drop in grades at the end of the first semester. This can be explained for the upper group by the need to adjust to much greater competition at the University than was experienced in community-junior college.

A longitudinal study of transfer students from public and private community-junior colleges in Georgia was begun in 1964 (Fincher).[29] The first phase of the study of those seeking transfer showed them to be a heterogeneous group with complex admission problems. The senior institution freshmen had an initial advantage over community-junior college freshmen who had lower verbal and mathematics scores on the SAT.

The most comprehensive study of the transfer student is that conducted by Knoell and Medsker and reported in two technical research reports--one focusing on articulation and coordination among colleges (1964a)[6] and the other focusing on the student (1964b)[7]--and a shorter summary of the findings and their implications (1965)[30]. The core group included 7,243 community-junior college students who transferred in 1960 to 43 senior institutions in ten states representative of all sections of the country and different types of organization and control of higher education. The states selected were California, Florida, Georgia, Illinois, Kansas, Michigan, New York, Pennsylvania, Texas, and Washington. There was a definite tendency for students to transfer to the state senior institution unless they were excluded by selective admissions policies. The study showed that they had less chance of success at the larger senior institutions than at other types of schools. New York had a smaller percentage of community-junior college graduates transferring to its senior institutions than was true of any other state, but many of its students transferred to out-of-state institutions. The study also used transfer and native students who graduated in 1962 for comparative purposes. The study used interviews, questionnaires, records, interviews with faculty and staff, and meetings of college personnel concerned with coordination procedures. The transfer students were like the native students in most characteristics. (Typically, they were white, Protestant, of native-born parentage, graduates of general or college preparatory programs in high school, and ranked in the upper half of their high school classes. There were many more men than women, and their high school records were not as good. Although economic reasons were given for attending community-junior college, the students were enthusiastic about their community-junior colleges, particularly about their instructors and the scope of the of the curricular offerings.) It was estimated that 75 percent would persist to their degrees, but less than half graduated on time. The accumulative attrition rate by the beginning of the fourth year after transfer was 29 percent. There was a drop in grades the first semester after transfer, but steady improvement was then shown. The initial drop often brought down their total grade-point averages while they were in the senior institution. Native students usually had more academic aptitude and higher grade-point averages. The pattern of native student transfer differences was less like to occur in the teacher's colleges than in the large state senior institutions. Social class variables, except as they caused economic problems, did not seem to influence success. On the whole, the students seemed to have the same probability of success in each of the broad major fields. Community-junior college grades were more predictive of success than high school records except that a poor high school record not balanced by a considerably above-average community-junior college record was often a predictor of academic difficulty. Students who had decided on the particular colleges for transfer by the end of their freshman year had less difficulty. There was wide variation in chances for success among the states, the types institution, and individual institutions themselves. There is probably at least one institution in each state at which a particular community-junior college student--even with a "C" average--can succeed.

Lambe[31], in a study of community-junior college transfer students at Western Michigan University, found that students with grade-point averages below "C" encountered serious academic difficulty, while those with 2.00 to 2.49 averages encountered difficulty the first semester but usually improved. Except for the below "C" group, the transfer students performed somewhat better than the native students. Those entering the School of Education showed the best performance. Most of them had been in college transfer programs. There were significant differences in performance by those from different community-junior colleges, but students continued to hold the same relative ranks they held before transfer. The principal problems of adjustment upon transfer were increased costs, difficulties in scheduling required courses, and loss of credits.

Problems of Orientation

Present orientation programs, usually given with emphasis on freshmen and before the opening of the fall term when many transfer students were working, were generally considered unsuccessful by the students interviewed by Knoell and Medsker (1965).[30] Students had not thought about the programs they wanted, but suggestions that orientation might include wives, might be in the spring before transfer, and the major department might provide orientation after transfer. Colleges should take a look at their new transfer students--age, class levels, colleges from which they come, sex, housing, needs, and interests--in developing special orientation procedures for this group. Orientation during this whole first year is needed, and special advisors with an understanding of community-junior colleges and the problems of transfer students may be needed. Orientation should start before transfer with printed matter sent to students about the college--its policies and requirements. Students found visits to the campus very helpful, especially if they had a chance to talk with their advisors. Texas A&M has a special day in the spring for community-junior college students and counselors. Students stay in the dormitories, talk with students and their advisors, and learn something about the campus.

The following are suggested needs for consideration in the orientation of transfer students:

a. Review of appeal procedures for redress of grievances in evaluation of transfer credit.
b. Description of opportunities for transfer students to participate in the student activities program.
c. Explanation of the graduation requirements which have been fully satisfied by work transferred.
d. Clarification of graduation requirements yet to be completed, including specific courses for meeting these requirements.
e. Review of available student personnel services, especially financial assistance opportunties. (The Joint Committee on Junior and Senior Colleges)[32]

Academic Problems[30]

The first set of problems resulting from grade point differentials and the drop in grade point average normally were experienced the first semester after transfer. Students often become discouraged at this time and need help from counselors or advisors. With some students, particularly those who had a "C" average in community-junior college, this drop in grades may cause dismissal since community-junior college grades are not usually considered in retention policies. It may also affect completion of graduation or major sequence grade point requirements on time. When schools have raised admission requirements for freshmen but not for the transfer students, the latter were sometimes in competition with native students of higher academic ability as well as two years' experience with the "system."

A second set of problems arises from different grading systems and different methods of teaching. In community-junior college, a "C" grade may be given for compliance with requirements at only a minimally acceptable level. This is an area that needs exploration by both community-junior and senior institutions. The community-junior college should also be certain that students who are transferring have effectively made up all deficiencies. The students may need to remain in the community-junior college for more than two years to complete lower division courses rather than take them after transfer and have a greater chance of failure. The increase in both quality and quantity of work expected was a problem for some students. Some felt they had not learned all they should in their community-junior college courses. They were unprepared for the types of examinations and other evaluations. Adjustment was needed to different teaching methods and, particularly at the larger senior institutions, the impersonality of student-teacher relationships. Knoell and Medsker suggested that the pace might be stepped up in the second year of community-junior college. "Methods of instruction, techniques for evaluation, assignments of reading, and term papers--all these could be made to approximate university instruction somewhat more closely as the time approaches for the students to transfer."[30] Another problem might arise, often in experimental programs, where the organization of course content at either institution was such that articulation was impossible.

A third group of problems is concerned with evaluation of credits. Students are frequently given formal admission or told that a certain amount of credit is transferable. They assume that all of this credit is applicable to degree requirements. When the evaluation of their credits is completed, they find that, while the credit is placed on their records, some of it does not count toward a degree. This is often true of some of the occupational and specialized courses in the community-junior college. Students should know before transfer the exact status of their credits and what requirements for a degree they will need to fulfill.

Still a fourth set of academic problems is concerned with delay in graduation. This can occur in several ways: Students are normally not allowed credit for courses in which they received a "D" grade and may have to take more work to raise their grade-point averages. Students may have to repeat a course, drop a course, or change to another course because of poor articulation of content in sequence courses. Students may have to take extra lower division courses to meet the requirements of a particular school or department. If a community-junior college is too small to provide adequate staff, facilities, or diversification of offerings, the students may have to take more of these courses at the senior institution. Consideration should also be given to allowing the students degree credit for community-junior college courses which have no equivalent in the senior institution and also allowing some of them to be substituted for required courses in the same area.

Social Problems

Transfer students tended to have much less identity with college life than native students.[30] This came about in part because some of the transfer students were older and married; some were working part time, and they felt the need to devote all their time to their studies. However, the students remarked that recruitment into campus activities was directed toward freshmen. Student services personnel should make a special effort to help transfer students find a place in college life. (The Office of Student Affairs at Pennsylvania State University holds an annual spring conference for student leaders from community-junior colleges and senior institutions to discuss mutual problems, plan special programs, and meet with university staff. When students transfer, they are already in a position to assume leadership roles.)

Financial Problems

The financial needs of many community-junior college students including those who transfer are frequently mentioned. Students choose community-junior colleges because of the low cost, the chance to live at home, and the opportunity for employment while attending. Many students attend part time while working or drop out for a while to work. The best statement of this problem is given by Knoell and Medsker in their study of the transfer student. The transfer students usually come from less well educated families with lower incomes than those who enter the senior institution as freshmen. "One of the threads running through the entire study is the economic plight of the junior college students who transfer to four-year institutions."[30] About three-fourths of the men and only slightly less of the women were partially self-supporting--40 percent of the men received no help from their parents, and 20 percent of the men were paying all costs from their own earnings. Students had tried to save money before transferring, realizing they would need more time for study. About twice as many worked during community-junior college as in the first year after transfer. Others were working fewer hours.

Three types of students encountered academic difficulty because of financial need: (1) the employed community-junior college student who was usually able to obtain "C" grades but had never really learned to study; (2) the student who worked between community-junior college and the senior institution thereby losing some of his study skills and usually having difficulty in advanced courses in science and mathematics because of a loss of knowledge; and (3) the student with enough money for one semester who expected to obtain aid for the second semester but whose grades dropped, typically, making it difficult for him to receive aid or part-time employment. Students who lived at home were unrealistic in their estimates of cost; many mentioned that increased costs were a problem during the second semester. Part-time jobs were scarcer and hourly rates lower than they had expected. Senior institution policies often discriminated against helping new students locate jobs. Failure to understand aid and loan policies also created problems. Students had not understood academic requirements for aid nor that it was usually committed for the entire year and was not usually available in the second semester. The drop in grades usually experienced at the end of the first semester frightened students into giving up part-time jobs. Financial problems ranked first among reasons given for voluntary withdrawal. The present trend toward increased aid for capable high school graduates to attend senior institutions should be extended to capable community-junior college students; and colleges should consider their loan policies for transfer students, many of whom have only a "C" average.

In the study made by White[33] of transfer problems and policies based on data from 166 senior institutions, the problems of financial need are also discussed. About three-fourths of the institutions reported that scholarships are available to transfer students but competition may be keen. Most colleges mentioned loans, jobs, or other aids; but a student must have been in residence a semester or a year before making application. Actually, these students should not enroll until they have enough money for the first year. In 68 percent of the institutions, the annual expense exceeds $2,000, which is prohibitive for a large proportion of transfer students.

Recruitment Problems

The problem of finding and interesting students to teach industrial education is complicated both in high school and community-junior college by the "image" of vocational education as being of lower status than academic curriculums. Good students tend to enter the academic programs; and, as Larson's[23] study shows, the trade and industrial courses have a large proportion of men of low academic ability. Greater awareness by counselors of opportunities in the areas encompassed by industrial education, of the educational requirements for entering specific programs and reaching specific levels of competency, and of the student characteristics adapted to these goals would yield a larger base of students committed to industrial and technical education with the potential to complete a full college program. Interest in the occupational area may develop in high school, particularly if the high school programs have been articulated with community-junior college courses. Many students from general and college preparatory programs enter vocational programs in community-junior college.

For many students, community-junior college is a time of exploration. In the Knoell and Medsker study[30] more than one-fourth of the students changed majors in community-junior college. The largest shift was out of engineering, often into business administration. A full 30 percent of the changes made by the men in the community-junior college involved engineering. Reasons given were poor grades in mathematics and science and the rigor of the engineering program. Many of these students with proper counseling might have been successful in other technological areas.

Ressler,[34] in a study of 310 students in industrial teacher education in Ohio, found that, while many had taken industrial arts in high school, the majority of majors had decided on teaching after entering college. The greatest influence on their choice came from teachers in the field.

Knoell and Medsker[30] also stated that students who had decided on career and educational plans and determined the particular institutions to which they wished to transfer by the end of their freshmen year, had the greatest potential of success in completing their plans. It would seem that in planning for those teachers who would progress through a full program from high school to a degree, recruitment efforts should be centered on high school seniors and community-junior college freshmen.

New York City has been conducting a program for the past eight years to recruit high school seniors to prepare for industrial arts teaching. Parents are reached through speeches by teachers at Parent-Teacher meetings, through literature addressed to them, and through exhibits and television programs planned to make the general public aware of industrial arts in the schools.[35]

Guidance counselors have proved an obstacle in teacher recruitment. They must be kept aware of the industrial arts programs even in their own schools, they do not normally program college-bound students into industrial arts, and they do not realize that they cannot speak of becoming teachers to the average industrial arts students because they must be capable of completing degree programs. Industrial arts teachers in all schools have the job of breaking through the blinders of the counselors.

Student nights are sometimes held by the local professional organizations to which the teachers belong where certificates and trophies are presented by industry and various associations to students for good performances. In the fall of each year, the seniors who are recommended by teachers and who have shown an interest are interviewed and invited, along with their counselors, to a meeting of the Future Teachers of Industrial Arts. Representatives from each of the four colleges giving a bachelor's degree in industrial arts and representatives from community-junior colleges talk to the students. Recruitment literature is handed out.

Community-junior colleges are a fairly new source for teacher recruitment in New York City, but in 1968 the first group of industrial arts community-junior college graduates in New York transferred to City College. Some of these students were not able to qualify for the senior institution as freshmen, but they were able to qualify after their community-junior college work. Examples of some of their literature and methods used to interest high school seniors are presented in Teacher Recruitment by the New York City Board of Education Industrial Arts Department.[35]

A high school in Phoenix, Arizona, also has an annual meeting of the Central District Industrial Education Association to which teachers bring students they want to interest in teaching (Anderson).[36] This school also devotes one day to discussions about teachers and their roles.

R. D. Morrison, speaking at the Institute on Critical Issues in Vocational and Technical Teacher Education in Small Colleges held at North Carolina State University in

1967 (see Bell)[37], said that the most important thing in recruiting is the development of a good approach by a good teacher. Teachers can usually spot the students they think will be good teachers. Then they should talk to the students and enlist the help of others who should be interested in their careers.

Recruiters of community-junior college freshmen could well talk over suggestions from other areas and programs for other purposes. Teachers and transfer students in the field should be asked to suggest students, and either counselors or teachers should give them informational career brochures of a general nature. A visit to the community-junior college campus by faculty and students (particularly if they are transfers from the college being visited) could be utilized to talk with counselors, impress upon faculty the need for their help in meeting the shortage, and talk with students. Students might at this time be given full information on all schools in the state offering industrial teacher education programs, including lists of courses offered, degree requirements, how to plan community-junior college courses to provide good articulation, laboratory facilities, specialties of each school, and general information about characteristics of the different schools. This could be followed by a visit to the senior institution by both freshmen and sophomores to actually inspect facilities, meet faculty, and ask questions. Sophomores who had already planned on transfer might at this time check with advisors on their plans for the coming year. Faculty and counselors might also be invited, but programs for them should probably be separate from those for students. Every attempt should be made to help the students complete all lower division work, make up any deficiencies, and meet any special requirements so that they may transfer with full junior standing. A visit from the senior institution faculty also offers the chance to access the value of certain technical courses, their teachers, and facilities in the community-junior college, and to obtain insight that may help in the guidance of students from this college.

Summary

Transfer students in industrial teacher education have much the same problems as all transfer students and should have help from counselors and faculty advisors. Some students may have particular problems with articulation of course content in technical areas, with some having community-junior college courses in technical fields not accepted because they were terminal and not transfer courses. They may need to take some proficiency tests to determine placement, particularly if they have been out of school for a period between the community-junior college and senior institution. Help for problems of this nature should be available within the department, either from a departmental counselor or a faculty member with a knowledge of the community-junior college. When a part-time or summer job is needed, it would seem particularly important to help the student find work directly related to his major that could also help him to accumulate the work experience needed for a future position. Some schools have a cooperative work-study plan which enables the student to accumulate systematically the necessary work experience. The 1968 federal legislation has provided funds for financing the preparation of teachers in occupational areas so that, hopefully, more aid will be available for these students.

Counseling, advising, and some sort of articulation agreement with respect to the student in industrial teacher education are needed before, during, and after transfer in the following areas:

1. Helping the student determine his major and assess his interests and abilities for teaching as a goal.

2. Selecting the transfer institution that is best for the particular student. This requires a knowledge of courses and facilities available in his major; how the course sequences articulate with his community-junior college courses; particular lower division, graduation, and major requirements; his chances for success; and other characteristics of the institution.

3. Determining what community-junior college courses will be accepted for credit as well as for graduation or major requirements. What additional lower division courses not available in community junior college will he need? Are there courses to be repeated without credit because of a "D" grade in community-junior college? Are there courses

that will have to be started over because the manner of organizing the material makes articulation difficult?

4. Giving proficiency tests for placement purposes before transfer if they are to be useful to the counselors.

5. Giving English proficiency tests, when they are required, before transfer.

6. Encouraging the student to complete all possible lower division requirements and remove all deficiencies in community-junior college so that he may transfer with full community-junior standing even though this may mean two and one-half or three years in community-junior college. Knoell and Medsker (1964a)[6] found that many transfer students were held or dropped back, even though they earned satisfactory grades in their majors and in advanced courses, by poor grades in lower division courses taken in the senior institution and by inability to complete English proficiency requirement.

7. Helping the student select and schedule his classes, particularly considering the time needed for student teaching.

8. Helping the student after transfer with academic and personal problems before they become so serious as to cause withdrawal.

9. Assisting the student with adjustment to the senior institution, with study problems, housing, extracurricular activities, etc.

10. Reviewing the student's financial situation with him before transfer and helping him make adequate plans to meet his needs.

11. Making the student feel that someone has a personal interest in him and his goals.

This requires cooperation of community-junior college and senior institution counseling services, of faculty in his major department, and of other administrative departments responsible for admissions and credit evaluations.

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The Future

Predictions are numerous about the growth and organization of education after high school; it is certain from new state legislation and state master plans that the enrollment in community-junior colleges will increase rapidly in the next decade. The number of youth desiring to enter college is rapidly increasing. Pressures on senior institutions are bringing about a limit on enrollments and increase in admission standards since they cannot expand rapidly enough to meet increasing demands. Tuition and fees in senior institutions are rising. Pressure on the tax dollar influences the legislature in its provisions for public higher education. The concept of public education beyond the high school as part of the ideal of equal opportunity for all has been growing. With a low-cost, open-door community-junior college within commuting distance, enrollments will increase and a greater proportion of college freshmen will be enrolled in the community-junior college. Area vocational schools are also opening rapidly in many states. The number of occupational courses offered is also increasing as the needs of industry are better defined.

The high proportions of entering students wanting academic transfer programs, even though many fail to complete them, has resulted in predictions that area vocational schools will become comprehensive and that community-junior colleges will become more status conscious and put more emphasis on transfer programs. As senior institutions raise entrance requirements for freshmen, sending more students unable to meet the requirements to community-junior colleges, the problem for marginal transfer students will become greater as they compete with a group already selected on the basis of academic ability.

A more serious problem is where will the transfer student go? With increasing community-junior college enrollments will come increasing numbers desiring transfer. State master plans have not provided for this expansion. Dwyer[1] states that New York has failed to make provision for these students. Michigan will not have the facilities to accommodate the anticipated number of applicants, and its senior institutions will probably limit the number of transfer students. The main problem is one of finance. The University of California and other California state colleges now must reduce their lower division enrollments in order to make room for more transfer students. Knoell and Medsker state: "There should be plans for the orderly accomodation of these students and the development by coordinating agencies of undergraduate curriculum master plans to insure that new opportunities will be available as needed."[2] Senior institutions are already facing severe shortages of space and will be tempted to abandon an open-door policy for transfer students. "While it seems unlikely that senior colleges and universities will abandon their freshmen classes completely, the trend toward enrolling a high proportion of new freshmen in local two-year colleges seems irreversible."[2] Alvin C. Eurich,[3] however, predicts that by the year 2000 many strong liberal arts colleges and universities will have discontinued their first two undergraduate years, since the responsibility for lower-division work will have come predominately within the province of the community-junior college.

At present, there are a few senior institutions that offer only upper division and graduate work, but it cannot as yet be called a trend. The Dearborn Campus of the University of Michigan, for example, is a commuting university with an emphasis on technology that has no lower division work. The lower division is offered primarily by Henry Ford Community College. Florida, to meet the needs of community-junior college transfer students, has recently opened two senior institutions that are upper division and graduate only, Florida Atlantic University and the University of West Florida. Any holder of an associate degree can be admitted.

Faculty

Grant Venn[4] points out that the need for vocational-industrial technical teachers is great not only in terms of numbers, but in terms of a new kind of person in many fields. The upgrading and retraining of those already teaching, and the expanding and improving of education for new teachers is necessary to meet the demands of new groups needing vocational education, of new developments in teaching technology, and of new occupational fields to be served. Some of the occupational areas are: paramedical, child care, teacher aides and assistants, public service fields as social work and recreation, as well as cooperative work-study programs and occupational orientation for younger students and their parents. There is a need for people who know how to organize instructional programs in the schools to give occupational orientation and information to young people, starting at the elementary level.

> We do not have any people prepared in this area and, as far as I know, do not have programs specifically planned for this area. (Regarding cooperative work-study programs to provide work experience directly related to school learning,) I believe it is going to take a specially trained kind of person who understands industry and its problems, who understands the local community, who understands the school, the vocational program, and can tie these packages together.[4] (see Vivian and Hoffman)

People are also needed specifically:

"to teach short, intensive entry skills programs leading directly to a job.

to teach the disadvantaged in secondary and post-secondary programs.

as a specialist in working with dropouts and in helping the youngster make the transition from school to work, in placement and follow-up.

to teach slow-learners and students needing low-level job entry skills.

to teach and retrain adults."[4]

Faculty Development Programs

A number of interesting programs for advanced degrees have been developed. Rutgers offers a masters program for preparing vocational teachers to teach culturally-disadvantaged youth (O'Brian and O'Neill)[5]. Emphasis is on broad training in sociology, social psychology, learning concepts, and teaching methods; the program includes three direct field experiences. Rutgers also has an advanced degree program based on the knowledge that a symposium of leaders thought it was necessary for a leader in vocational education--counseling and guidance, labor economics, social psychology, group dynamics, sociology of work, industry and minority groups, labor-management relations, industrial organization, training, facilities, and the concepts of vocational education (Schaefer and O'Brian)[6]. Olivo[7] suggested that graduate programs for administrators include knowledge and experiences related to administration and supervision, occupational analysis and curriculum development, concepts of vocational education, planning facilities, financial matters, laws, regulations and policies. A graduate degree intern program for new administrators, who have already accepted a position, is in operation at Oswego College. Field experiences involving studies of industry and administrative organizations throughout the country are correlated with course work and actual application of new concepts and ideas to the student's own organization.

There may be need for a different degree for high school and community-junior college teachers who want advanced graduate work that has relevancy for their teaching. This might be beyond the masters but not so specialized or research orientated as the Ph.D. Some do offer specialist degrees to fill this need. In addition to a breadth of subject matter and advanced work in the major area, professional education courses should be included in the program for such a degree. Opinions differ as to the nature of such courses.

W.L. Swanson[8] studied the content of masters degrees in industrial education by having judges develop a list of good practices and then asking for evaluation of their programs by all departments with such programs. The 87 percent responding rated professional education as satisfactory, research and technical training not satisfactory, and general education least satisfactory of all.

The growth of vocational education as the result of the legislation and concern of the federal government, and increasing concern and involvement of the states, and a growing new concept of the place of vocational education in the total educational pattern has implications for the types of training future teachers may need. Teachers will be needed for the training and retraining of adults for whom special educational methods and perceptions may be needed--namely, for the disadvantaged, the slow learner, the undereducated. In high schools, with the development of programs for several types of students at varying levels, the teacher will need to know how to adapt curriculum, goals, and methods for each group. The same is true of the heterogeneous community-junior college population. The development of many new types of programs in answer to the needs of industry in area vocational schools, community-junior colleges, and adult courses for which teachers will almost certainly need to be recruited from industry will require more teacher-trainers with a fairly broad background who can provide needed pre-service and in-service training. Teachers should be trained as industrial arts, trade and industrial, or technical teachers, and for specific kinds of institutions and students. There is a growing demand for pre-technical courses in the high schools articulated with community-junior college courses and for industrial courses that can either lead directly into work or continue into community junior college programs. The growth of area vocational schools, community-junior colleges, and expansion of high school or post-secondary enrollments means that more teachers in industrial education will be needed. Kentucky, for example, is trying to meet this need by retraining industrial arts teachers. There is a growing interest in work-study or work-experience programs and some exposure to the successful operation of such programs might be included in the teachers' training. New emphasis may be needed for industrial teacher education and certainly more such teachers will be needed in elementary and junior high schools if the new concept of vocational-industrial and technical education as a central part of the education of all children gains acceptance. The 1968 report of the Advisory Council on Vocational Education states:

> First, starting early in the student's formal education he must learn more about work, its dignity, and his relationship to the occupational world. Actual work experiences should be included.
>
> Second, the subject matter of the school and vocational requirements need to be realized

> so that education becomes more powerful in terms of its occupational potential. This involves a high degree of flexibility and a definite movement toward individualization of instruction.
>
> Third, the hard-core content of vocational education--the part that makes a person employable--must be adjusted to accommodate a wider range of occupational opportunity and a larger number of students.[9]

The report of the Advisory Committee on Vocational Education expresses a concern for making education more relevant and more meaningful. Some programs are structured to make general education more meaningful through its practical relationship to vocational education; in others, vocational education or information result from general education. There was also concern about gaps and lack of coordination in existing programs. A common characteristic of many programs and projects was the recognition of the need for more comprehensive planning. There was general agreement that the success of innovative programs was largely dependent upon and directly related to the degree of unity which could be formulated for the total program.

New Trends

Emerson identifies the following important trends in occupational education for the future:

> Articulation of occupational education curriculums at all levels, with specialized programs at higher levels.
>
> Development of technical education and perhaps other tracks in high schools leading to post-high(school) programs.
>
> Broadening of curriculum objectives aimed at clusters of related occupations followed by specific education.
>
> Occupational education (as) an integral part of total education and in varying ways included at all grade levels.

> Greater status for occupational education.
>
> Expansion of offerings particularly for employed workers.
>
> (The) Increasingly important role for the community college in occupational education. In the years ahead the technician will need breadth as well as specialization and this can best be provided by the community college.[10]

If the community-junior college is to make significant contribution to vocational-industrial and technical education, it must be large enough to provide the needed enrollment; its administrators must understand the program; faculty, facilities, and space must be available; and there must be a good working relationship with industry.

Some of the new approaches and ideas in occupational education are described by Tuckman and Schaefer.[11]

> The cluster approach appears to be a necessary and fruitful approach to curriculum development. As the number of occupational titles increases (and changes), it will be incumbent upon curriculum developers in vocational education to build curricula that provide for the possibilities of skill transfer. An analytic approach . . . will be required.[11]

This concept has developed wide interest. The University of Maryland conducted research aimed at developing a middle between two points of view--whether vocational-industrial and technical education should prepare highly skilled students for specific occupations or should provide broad programs of general training for a wide variety of occupations. The essential and common components of occupations are determined; occupations are organized into families or clusters. The high school student studies a family of occupations and acquires skills and knowledge necessary for several related occupations. Such diversification enables a student to assess his own abilities and interests, to change his mind, and obtain skills which could be transferable if a particular job was discontinued. The state of Oregon provides an interesting example of this concept in operation. Further studies of the occupational needs of the state and its regions form the background for development of occupational clusters and curricula appropriate to them. Articulation between high school and community-junior college programs allows for greater depth and specialization at the upper division level. Donald Maley[12] at the University of Maryland has been developing experimental secondary school programs, including the preparation of both curriculum materials and teachers for different occupational clusters.

The multitrack idea in curriculum planning offers occupational courses on several levels to meet abilities and interests of a variety of students. The Automobile Manufacturers Association has developed curriculum guidelines and instructional materials to prepare auto technicians and less skilled auto mechanics. This idea has been applied in nursing with three levels of occupations, in aircraft mechanics, and in construction technology. This concept can be more fully applicable if both jobs and educational programs of industry are reorganized. (Burt)[13]

The Richmond Plan (see Cogswell Polytechnic College)[14] attempted to do something about the poor high school preparation of students at Cogswell Polytechnical College. A high school in Richmond, California developed a pre-technical program in which English, mathematics, science, and technical courses were correlated into one program of interrelated knowledge. The plan was then tried in 19 area high schools under a grant from the Ford Foundation. A similar program of unified course work is project FEAST, a high school program for the food and hotel industry. It makes use of a strong industry-labor advisory committee. Plans are under consideration for pilot projects in business and hospital occupations. These high school programs lead either to employment or to further education. Contact is maintained with industry through visits to industrial operations and talks given at the school by industry personnel concerning occupations. A program of this type may require special teacher training. It is necessary to "retrain" teachers but the ideal way would be pre-service teacher training programs in which the student could become involved in on-the-job training for an inter-disciplinary program. (Asbell)[15] The teachers of all disciplines must work as a team in coordinating curriculum and instruction. Objectives are defined in measurable terms. Students must know both what they are doing and why they are doing it. At present, there are 40 schools in the San Francisco Bay Area with programs using the inter-disciplinary process adapted to 12 different occupational areas.[9]

After a study to see what their graduates actually did and realities of employment in the area, the Quincy, Massachusetts school system realized that 75 percent of their educational budget was being spent for educating 25 per cent of the students who planned academic degrees. Project Able was organized in conjunction with the American Institute for Research in Pittsburgh. This project identified 11 broad families of vocations and common components of basic training for 31 major occupations. A new school has been built with movable walls, a flexible floor plan, a library that is both a resource and work center, and an adaptable plan for schooling from ninth to fourteenth grade students. Individualized knowledge will be utilized as much as possible with skills organized into learning units and the learning units organized into individual programs to fit the needs of each student. Learning units may be drawn from different fields to fit individual training. A student may leave school prepared for work at a relatively low level or continue on to a higher level. The school is also planning a course in basic technology for all students which can start as early as kindergarten leading to an understanding of how things work. The course can also be a prime tool for realistic vocational guidance.[15]

Developments in new media and instructional methods--television, programmed learning, computer, etc.--, in staffing patterns--team teaching, a diversified staff--, and flexible scheduling all have implications for needed change in teacher preparation. Polos[16] states that team teaching allows for a more efficient utilization of teachers, better use of the unique talents of different teachers, and a better introduction for beginning teachers. This procedure is being used in a number of schools and in some teacher education courses, for example, at the University of California and Mississippi State University.

Team teaching may be of value in some vocational courses. Burt,[13] however, citing the experience in an instrumentation program states that great lecturers can be used but that team teaching is unworkable on the technical level.

> Experience has shown that a course presented in this fashion is virtually impossible to keep in logical sequence and that the lecturers will present their subject at widely varying levels of instruction.[13]

The student may be confused by variations in terminology.

This criticism illuminates problems that can occur if team teaching is utilized in name only. The true concept of the method requires careful advance planning by the team so that the teaching is coordinated and each team member understands what he and the others are doing.

The concept of a differentiated staff as outlined by Allen and Wagschal[17] would require a redirection of some teacher training programs. They suggest a vertical differentiation from aides through paraprofessionals through assistant teachers to a master teacher with idenifiable competencies determined for each step, and progression possible to the extent that a teacher can demonstrate proficiency for the next step up. Training programs would be devised for various levels of teaching personnel and in-service programs structured to help their upward progress.

Flexible Scheduling

Flexible scheduling with the use of the computer is proposed by Dwight Allen of Stanford University (see Center for Research and Leadership Development in Vocational and Technical Education).[18] This is based on a performance curriculum with performance elements and definitions. The task to be learned is defined in terms of levels of achievement. These levels of achievement should be time-independent. Student progress should not be measured in terms of having sat through so many hours of class, but in terms of what he has learned. This may require different amounts of time for different students. Flexible scheduling requires restructuring the curriculum to identify performance criteria instead of time criteria. Differentiated staffing can be used with technical and support personnel (possibly several different kinds of people with different training and background) in addition to professionals. Class size may be differentiated according to purpose. A lecture group of 200 may meet a half hour a week, and small group sessions may be needed for different amounts of time. Some classes may be only short-term. They may be student-led, production-oriented, or discussion centered. Where in the program is a small group needed; where should it be scheduled? Open laboratory and shop is an important part of this. If the student has about 40 percent of his time free from scheduled work he can be sent to the laboratory or shop to work on something until it is accomplished instead of having laboratory assigned for a three-hour block. This requires a staff member in the laboratory or shop to help him. Student assignments can be of varying lengths under this arrangement. To do this requires individual student, and class size scheduling; this is where the computer is useful.

Computer Assisted Instruction

There is an experiment underway in the area of computer assisted instruction at Pennsylvania State University which is described by Brandon (see Center for Research and Leadership Development in Vocational and Technical Education).[18] Writing programs that will be understood by the student and anticipating student reaction and questions is a problem. Individual differences between students and teachers can be a problem when using the computer. This plan is being tried out in technical courses. The system should not be thought of as sufficient to the complete instructional task but as a tutor. If the material is properly programmed, it should be relatively simple to couple up entire state programs with terminals and computers that can aid students in technical courses, in-service training for teachers, etc. The computer is being used in vocational guidance to match up jobs and student characteristics. It might be used in curriculum construction if a matrix can be created to accommodate job analysis and curriculum content.

The New York Institute of Technology is using a computer to assist the guidance staff in keeping records of individual student profiles. The computer will help the counselors make predictions for the student's future performance and aid in designing an individual program for each student.

Programmed learning may involve a number of different media and purposes. Delta College in Michigan has been using it in improvement courses in mathematics, and as aids in science and basic English. The programs allow for individual progress; and by using teacher aides for the routine work, the teacher has more time for individual work with students. Delta has a program resource center to which professors can refer students with special needs of interests. Bakersfield College in California has been using programmed learning as part of a basic electronics course, in computer programming, and in some areas of nursing. It is a satisfactory supplemental instructional device. Programming is used for certain units, not the whole course. Programmed materials in mathematics are in use at a number of California community-junior colleges. Los Angeles Valley College has a fully equipped study skills center which makes use of some programs. Television is also used for instruction by a number of community-junior colleges.

Moss[19] reports that while there is considerable experimentation in instructional methods, the results as yet do not warrant generalizations and widespread applications of innovative practices. We should focus more attention on the individual rather than groups "to identify the relationships among configurations of student characteristics, learning tasks, and learning outcomes."[19]

Problems relevant to both curriculum development and teacher education that need consideration are the implications of interactions among the psychological organization of content, methodology, personality, and attitude, and the need to devise some standardized approach or procedure for correlating or integrating the content from varied fields and disciplines with primary focus upon occupationally related situations.[19] Before adopting an innovation study, its value and application to specific schools, programs, facilities, students, faculty abilities, and the possible value it has for a particular purpose and cost should be considered.

Moss summarizes the state of teacher education programs:

> We need very much to try to establish a system of verified principles which will permit us to understand and control the teacher education process. At present we are operating programs primarily on the basis of tradition, 'conventional' wisdom, and personal experience. This does not imply that current teacher education practices are necessarily bad, only that we really do not know their worth, and that we cannot be reasonably confident about judging suggested means for improving present practices. No doubt there will soon be a rash of studies on micro-teaching and other applications of educational technology; these are relatively simple to research. What we really need, however, are creative efforts to devise practical, valid means for measuring teacher effectiveness; this is extremely difficult, but without it we lack objective criteria for judging the value of our teacher education efforts.[19]

Moss again says:

> The outcome of the necessary philosophical research may be a series of (teacher) job descriptions, each based upon different assumptions or perceptions of anticipated social, economic and educational conditions, perhaps further subdivided according to the educational level and student characteristics with which specific kinds of vocational-technical teachers will be expected to deal. It might be quite possible, for example, to conclude from such studies that at least some teachers in the future will become less concerned about developing instructional materials and dispensing information, and become more involved in diagnosing and prescribing for learning problems and in organizing and coordinating systems of instruction for individual students.[20]

Lines of communication must be kept open between the community-junior college and senior institution administration, faculty, and counseling staff. Conferences over proposed changes can be helpful. When new information of value is obtained or when changes are contemplated, all concerned should be notified. Follow-up studies of transfer students in industrial teacher education should be made not only of grades, progress, and adjustment, but of their reactions after they have begun teaching to both community-junior college and senior institution programs. Counselors need to be kept aware of new requirements, new courses, new types of jobs, results of research, etc. The Guidelines of the Joint Committee on Junior and Senior Colleges state that communication between institutions may be facilitated by:

> a) inter-campus visitation of faculty and staff
>
> b) effective college publications
>
> c) dissemination of research results to practioners
>
> d) conferences and committee activity, including the preparation of proceedings and minutes of meetings[21]

Articulation activities should involve the types of personnel who deal most closely with the problems under consideration. Procedures need to be established for:

a) identifying appropriate problems
b) initiating needed studies
c) proposing solutions to problems
d) ratifying and implementing agreements[21]

Since articulation is both a process and an attitude, there are distinct advantages to having articulation machinery voluntary, particularly with respect to procedures for reaching agreements.

How may effective articulation be accomplished? In addition to some over-all administrative coordination, there will be specific articulation activities which will assume a variety of forms:

a) Ad hoc committees may be employed for the solution of specific problems.

b) Standing committees may be utilized to consider problems in particular subject fields.

c) State and regional conferences may be held to review matters in which there is broad interest.

d) Inter-institutional visits, newsletters, and similar expressions of cooperative planning may also strengthen articulation.[21]

Statewide articulation may be necessary to achieve some goals, but it should not be regarded as a substitute for local action. Through professional associations, some sort of articulation at the national level may also be achieved for particular disciplines.

Articulation machinery can be kept up-to-date and responsive to current problems by built-in periodic evaluation of the adequacy of the machinery, the effectiveness of types of personnel involved, the appropriateness of problems considered, and concrete achievements attained. Machinery should remain flexible and responsive to changing situations.

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Surveys: The Present Status of Articulation

The department heads, admissions offices, transfer students, counselors, and technical deans in respective senior institutions and community-junior colleges were questioned regarding present policies and problems relative to articulation. The results of these investigations are presented in this section.

Department Head Questionnaire Summary

The Department Head Questionnaire was sent to all chairmen of industrial education departments in the public senior institutions in the six states studied.

State	Number	
	Sent	Returned
California	9	7
Florida	6	6
Illinois	7	7
Michigan	7	7
New York	4 (2)*	4 (2)*
Texas	11	10
6-State Total	44	41

*Note: The State University Colleges at Buffalo and Oswego in New York have separate departments of industrial arts and vocational technical education. Questionnaires were sent to the separate departments in the two schools and the returns were counted separately. However in the returns listed above, each school was counted only once. For example, in New York four schools were surveyed with two (2) of those schools each having two departments.

Although 41 institutions responded to this questionnaire, it must be pointed out that 43 actual questionnaires were returned due to the division of departments in New York as noted above. The 43 department heads in the six states reported 7,518 students majoring in the teaching of industrial education. The total number of transfer students (including those in industrial teacher preparation) was 3,356. Of the 41 senior institutions represented by the respondents, 32 maintained an "open door" policy.

Additional material and information secured from the returned questionnaires follows.

I. Individual or Office Responsible for Evaluation of Community-Junior College Transfer Credits

II. Transferable Courses/Credits (from comm. col. to sr. inst.)
  A. Total Amount of Credits Transferable
  B. Amount of Acceptable Technical Course Equivalents
  C. Transferability of Non-Associate Degree Courses--Apprenticeship and Trade and Industrial
  D. Transferability of Credits in Specialized Areas
  E. Major Transfer Student Problems

III. Senior Institution Credit for Occupational Experience in Industrial Arts, Technical Education, and Trade and Industrial
  A. Work Experience Credit
  B. Acceptability of Technical Credit

IV. Effects of Transfer Students on Departmental Curriculum Planning
  A. Introduction
  B. Change in Number of Technical Courses
  C. Change in Curriculum Requirements for Industrial Education Major/Minors
  D. Change in Lower Level Technical Courses

V. Articulation
  A. Senior Institution Articulation Information Supplied to Community-Junior Colleges
  B. Staff Visitations
  C. Establishing Course Creditability
  D. Evaluation of Technical Competencies of Community-Junior College Transfer Students by:
    1. Department Heads
    2. Admissions Office
  E. Improved Articulation Techniques

VI. Methods Employed in Counseling and Recruiting Community-Junior College Transfer Students
  A. Methodology Chart--Community-Junior College
  B. Methodology Chart--High School

VII. Supply of and Demand for Industrial Education Teachers
  A. Implementation of Two-Year A.A.S. Teacher Aide Programs
  B. Adequacy of Technical Courses for Industrial Teaching Programs
  C. Apprenticeship Training

I. Individual or Office Responsible for Evaluation of Community-Junior College Transfer Credits

Admissions Office does all evaluation of both general education and technical courses	4
Admissions Office does all evaluation of both general education and technical courses that can be easily evaluated--only problem cases are referred to you	21
Admissions Office does evaluation of general education courses only	13
Department evaluates technical courses	15
Department evaluates all transfer credit	3
Other (specify)	6

It should be noted that, according to the department heads, individuals or offices other than admissions offices are responsible for such evaluation. (See Admissions Office Survey Summary.) Six department heads reported "Other" methods of evaluation, but only one gave a specific example:

From State University College at Oswego (N.Y.),

> Students may request re-evaluation of transfer credits by Ind. Arts Div. Director or Director of Records.

II. Transferable Courses/Credits (from com. col. to sr. inst.)

A. Total Amount of Credits Transferable

50% of the baccalaureate degree program	27
40-49% of the baccalaureate degree program	8
30-39% of the baccalaureate degree program	2
Other (specify)	6

B. Amount of Acceptable Technical Course Equivalents

About 100% of the technical course requirements	7
About 75% of the technical course requirements	8
About 50% of the technical course requirements	9
About 25% of the technical course requirements	15

C. Transferability of Non-Associate Degree Courses--Apprenticeship and Trade and Industrial

Trade and Industrial	------	Yes 16	No 26
Apprenticeship	------	Yes 5	No 36

Senior institutions which accepted apprenticeship training for credit provide several methods of evaluation.

From Eastern Michigan University,

"Examination"

From Ferris State College (Michigan),

Credit by competency examination. Eligible with minimum of 3 yrs. work exp. (Minimum) 55-60 semester hrs. credit for demonstrated competency in the area of specialization.

From the State University College at Buffalo (New York)

> Work-study internship area or specialization area of 30 semester hours

D. Transferability of Credits in Specialized Areas

Same as the total number of credits offered in this specialty by your department	10
Department counselor's judgment used to determine maximum credits offered	23
All of the technical credits in the specialized area	6
Other (specify)	4

This indicates the willingness of department heads to consider in thier judgments the suitability of such courses for transfer. The one specified exception was from the California State Polytechnic College:

> Usually can apply (beyond our lower division coursework) towards the 39 grt. units of free electives.

E. Major Transfer Student Problems
(See next page for chart pertaining to this.)

II. E. (Continued)

	Number of Responses (Dept. Heads)	Number of Responses (Adm. Offices)
Students come with too much concentration of credit in one technical area	26	12
Difficult to evaluate the quality of the work taken by transfer students in community-junior colleges	19	12
No way of accurately evaluating the competencies of transfer students from community-junior colleges	16	5
Difficult to plan a teacher education program with only the last two years under control of our department	19	10
Transfer students from community-junior colleges lose a large amount of credit in transferring to industrial education programs	14	3
Courses taken by students in community-junior colleges do not match the courses offered by our department.	16	9

It must be emphasized that the obvious differences in responses points out a problem in articulation within the same senior institution--lack of coordination between the department heads and the admissions offices.

III. Senior Institution Credit for Occupational Experience

A. Work Experience Credit

Industrial Arts	10
Technical Education	11
Trade and Industrial (Vocational)	20

This experience is evaluated by the following means:

Interview	13
Records/Recommendations	13
Testing	18

An additional method of evaluation was given by California State College at Long Beach:

> Application and records sent to Bureau of Voc. Ed. Examines. Credit is given on base of records.

B. Acceptability of Technical Credit

Thirty-three department heads reported acceptance of technical credit if the credit was classified as "transferable" by the admissions office.

IV. Effects of Transfer Students on Departmental Curriculum Planning

A. Introduction

Senior institutions should recognize that transfer students are qualified for advanced offerings. Departmental curriculum changes to meet the transfer students' needs should be in the areas of technical course offerings, lower level courses, increased requirements for graduation, and specialty concentration. In the area of changes, the number of technical courses affected was reported by only ten (25 percent) of the department heads.

B. Change in Number of Technical Courses

Those institutions whose number of technical courses did change offered some of the following recommendations:

From Northern Illinois University,

> Major interest in electronics technology as a program and hence different electronic courses requiring additional sections; support courses such as technical drawing.

From Wayne State University (Michigan),

> Fewer will be given by department.

From the State University College at Buffalo (New York),

> We accept courses for advanced labs--it decreases number of advanced lab offerings.

C. Change in Curriculum Requirements for Industrial Education Major/Minors

The survey showed that less than 10 percent of the department heads reported change in their curriculum requirements for an industrial education major/minor even though transfer students made up a large portion of their enrollment.

D. Change in Lower Level Technical Courses (See next page for chart.)

IV. D. (Continued)

	Increased	Decreased	Same
Drafting			
Calif.	1	2	4
Fla.	2	0	4
Ill.	2	2	3
Mich.	1	2	4
N.Y.	2	0	2
Texas	5	1	4
6-State Total	13	7	21
Electricity-Electronics			
Calif.	2	2	3
Fla.	3	0	3
Ill.	3	1	3
Mich.	2	2	3
N.Y.	2	0	2
Texas	5	0	5
6-State Total	17	5	19
General Industrial Arts (Shop)			
Calif.	1	1	2
Fla.	1	0	3
Ill.	0	2	3
Mich.	2	0	4
N.Y.	1	0	2
Texas	2	2	4
6-State Total	7	5	18
Graphic Arts			
Calif.	1	0	5
Fla.	1	0	2
Ill.	0	2	5
Mich.	3	1	3
N.Y.	2	0	2
Texas	2	1	6
6-State Total	9	4	23

IV. D. (Continued)

	Increased	Decreased	Same
Metalworking			
Calif.	2	1	4
Fla.	1	0	4
Ill.	1	1	5
Mich.	2	0	5
N.Y.	2	0	2
Texas	6	0	4
6-State Total	14	2	24
Power-Automechanics			
Calif.	2	1	4
Fla.	0	0	3
Ill.	3	1	2
Mich.	3	1	3
N.Y.	1	0	2
Texas	4	1	2
6-State Total	13	4	16
Woodworking			
Calif.	2	2	3
Fla.	1	0	3
Ill.	0	2	5
Mich.	0	1	5
N.Y.	2	0	2
Texas	3	0	7
6-State Total	8	5	25
Industrial Crafts			
Calif.	0	2	4
Fla.	1	0	3
Ill.	1	1	5
Mich.	0	0	4
N.Y.	1	0	1
Texas	3	0	6
6-State Total	6	3	23

V. Articulation

The median number of community-junior colleges from which 75 percent of the transfer students come to a particular senior institution is 4-6. Articulation becomes a serious matter since many of the community-junior colleges are so-called preparatory schools for the senior institution.

A. Senior Institution Articulation Information Supplied to Community-Junior Colleges

Only one out of the 43 department heads reported using a bulletin jointly prepared by the technical staff of the community-junior college and the industrial education department of the senior institution to indicate transferable courses. Eleven senior institutions used equivalency sheets for technical courses. Eight senior institutions used a catalog or brochure to inform the community-junior colleges of departmental policies. Additional articulation methods were reported by:

From Northern Illinois University,

> Articulation conferences with a number of representatives from many jr. colleges; more fruitful are our meetings with counselors and faculty where course comparisons are made and equivalencies are established.

From California State College at Long Beach,

> I meet with J.C. people and we discuss the program. They then develop material for their college catalog for transfer purposes.

B. Staff Visitations

A staff member from the industrial education department visits each of the community-junior college technical departments before transfer courses are approved:

Yes 13 No 28

C. Establishing Course Creditability

Your general knowledge of the community-junior college	37
Course outline used	19
Amount of laboratory time required	19
Laboratory facilities at community-junior college	24
Qualifications of staff at community-junior college	29
Textbook used	11
Visit with the head of the technical department in the community-junior college	23

D. Evaluation of Technical Competencies of Community-Junior College Transfer Students by:

1. Department Heads
2. Admissions Offices

	Department Head Responses	Admissions Offices Responses
None	4	2
Course equivalents accepted at face value	24	12
Interview with individual student	23	13
Performance test	9	7
Written non-standardized test	10	2
Written standardized test	1	3

E. Improved Articulation Techniques

Department heads feeling the acute need for improved articulation have suggested the following techniques:

Using same course numbers	1
Using same course descriptions	10
Developing a joint uniform course outline	17
Sending textbook lists and courses of study for each of your courses to the technical department of the community-junior college	11
Providing in-service institutes for technical teachers in the community-junior colleges, i.e. having all metalworking teachers from all community-junior colleges in for a short-term institute	21

From San Jose State College (California),

> Develop basic content which should be covered in a specific introductory course.

From the State University College at Oswego (New York),

> Community Col. and Jr. College counselors should identify students that wish to transfer to teacher education in industrial arts, and arrange courses or program for better transfer.

VI. Methods Employed in Counseling and Recruiting Community-Junior College Transfer Students

A. Methodology Chart--Community-Junior College

Departmental staff visits community-junior colleges and talks to counselors and technical staff..............................Yes 30 No 7

Counselors from community-junior colleges are brought to campus for visit and orientation in your department............Yes 18 No 12

Descriptive folder of your department and opportunities in industrial education are sent to counselors..................Yes 30 No 8

Scholarship information relating to industrial education is regularly sent to counselors........Yes 7 No 16

Special audio/visual aids have been made available to counselors and to interest students in industrial education:

Posters...........................Yes 6 No 22
Filmstrip and tape......... ...Yes 2 No 21
Slide and tape.................Yes 7 No 20
Other (specify)...............Yes 4 No 19

General college catalog contains information that describes in a general way the opportunity to transfer technical credit from community-junior colleges to your program............................Yes 33 No 9

General college catalog describes specific course equivalents for each technical credit from community-junior colleges to your program............................Yes 4 No 25

Specific equivalency sheets showing your departmental requirements and the community-junior college courses that meet these requirements are provided to counselors..........................Yes 9 No 25

B. Methodology Chart--High School

Considerably less than 50 percent participation in the surveyed areas listed below can be justified since the senior institution is not aware of the potential high school industrial education student who plans to attend the community-junior college before coming to the senior institution of his choice. Some attempt is being made as is indicated in the results below.

Descriptive material concerning curriculum in industrial education is supplied to all high school counselors in your state...........Yes _17_ No _22_

Descriptive material showing equivalency courses that students can take at the community-junior colleges are supplied to high school counselors.................Yes _5_ No _29_

High school counselors are regularly invited to your department so it can be explained to them the opportunities in an articulated program between the community-junior college in their area and the program in your department...................Yes _11_ No _24_

VII. Supply of and Demand for Industrial Education Teachers

A. Implementation of Two-Year A.A.S. Teacher Aide Programs (See following page for chart.)

VII. A. (Continued)

	Yes	No
Would you be in favor of two-year, community-junior college curriculum for teacher aides in industrial education?	24	17
If yes, could this same program be used as the first two years of preparation for a baccalaureate degree in industrial education in your department?	20	3
Should your department help in establishing a pre-teacher industrial education curriculum in the community-junior college?	33	2

It is notable that department heads reacted favorably to proposals dealing with teacher aide programs and that such programs could utilize the first two years of the undergraduate degree.

B. Adequacy of Technical Courses for Industrial Teaching Programs

Are technical courses offered in the community-junior college adequate for?

	Yes	No
The junior high school general industrial arts teacher	18	22
Senior high school specialist industrial arts teacher	22	20
The vocational-industrial teacher	23	13
The technical education teacher	25	12

Should the following types of technical courses be accepted for credit toward a teaching major in industrial education?

	Yes	No
Data processing	25	13
Descriptive geometry	38	3
Manufacturing processes	39	3
Metallurgy	39	3
Quality Control	30	9

Indicate whether you believe the following to be strengths or weaknesses of technical courses offered in community-junior colleges as preparation for a teaching major in industrial education.

	Strength	Weakness
Less emphasis on project making	21	15
More lecture and less lab work	14	22
Some courses taught by engineers	19	13
Others (specify)	6	4

C. Apprenticeship Training

	Yes	No
Outstanding apprenticeship graduates should be encouraged to become interested in vocational-industrial teaching as a career	37	0
College credit should be allowed for practical experience taken in the apprenticeship	26	8
College credit should be allowed for the related instruction in the apprenticeship	22	10

Althouth 37 department heads agreed that outstanding apprenticeship graduates should be encouraged to become interested in vocational-industrial teaching as a career, it should be remembered that a 1969 graduate electrical, masonary, or plumbing apprentice started with $10,000+ annual salary. A teaching career would offer him considerably less with considerably more responsibilities.

Surveys

Admissions Office Survey Summary

This survey was distributed to the 44 public senior institutions in the six study states with industrial teacher education departments. (See Appendix for sample survey). The following number of institutions responded:

State	Number	
	Sent	Returned
California	9	5
Florida	6	5
Illinois	7	6
Michigan	7	3
New York	4	2
Texas	11	7
6-State Total	44	28

The analyses included in this section are:

I. Student Enrollment
   A. Percentage of Community-Junior College Transfer Students in Senior Institutions
   B. Time of Transfer from Community-Junior College to Senior Institution
   C. Industrial Teacher Education Majors at the Senior Institutions
   D. Industrial Teacher Education Major Transfers at Senior Institutions

II. Admissions Policies--Preferences

III. Transfer Credits
   A. Responsibility for Evaluating Transfer Credits
   B. Total or Limit of Transferable Credits
   C. Required Grade Point Average for Transfer Admission
   D. "D" Credits
   E. Number of Associate Degree Transferable Credits

IV. Community-Junior College Credits
   A. Establishing Quality Creditability of Technical Courses at the Community-Junior College
   B. Methods of Evaluating Community-Junior College Technical Courses

V. Equivalency Sheets

VI. Industrial Education Teaching Opportunities

VII. Transfer Problems

VIII. Articulation

I. Student Enrollment

A. Percentage of Community-Junior College Transfer Students in Senior Institutions

The figures dealing with transfer students at the senior institutions varied considerably in the six states surveyed. Ferris State College in Michigan reported a low of 7.1 percent, while the University of West Florida (an upper division institution only) reported a high of 76 percent. If these extreme cases are eliminated, the range would be 10 per cent (reported by five institutions) to a high of 69 percent (reported by the State University College at Oswego).

State	Percentage
California	41
Florida	37
Illinois	13
Michigan	15
New York	42
Texas	14
Six State Average------	27

B. Time of Transfer from Community-Junior College to Senior Institution

When do the majority of students transfer to the senior institution?

End of one year..................	4
End of one and one-half years....	1
End of two years.................	22

C. Industrial Teacher Education Majors at Senior Institutions

State	Total Majors
California	1268
Florida	421
Illinois	1180
Michigan	1602
New York	1517
Texas	1530
Six State Total........	7518

Taking into consideration that approximately one out of every four will graduate each year (this includes drops and adds), the senior institutions in these states will provide 1880 new industrial education teachers yearly.

D. Industrial Teacher Education Major Transfers at Senior Institutions

California State College at Long Beach and Florida State University each reported 90 percent transfer students in industrial education.

State	Percentage
California	43
Florida	20
Illinois	17.8
Michigan	28.5
New York	60
Texas	40.5

II. Admissions Policies--Preferences

All senior institutions have three possible admission policy clauses which deal with preferential treatment. They are:

"Preference given to entering freshmen from within (the) individual state."

"Preference given to community-junior college students from within (the) individual state."

"No preference between either of the above groups."

Of the 28 admissions offices which responded to the survey, 19 showed no preference between either of the above groups, six gave preference to community-junior college transfer students within the individual state and one did give preference to freshmen. Two senior institutions indicated other methods of preference in selection:

State University College at Buffalo (New York),

> "Currently, ratio of students is 60% underclass, 40% upperclass. This ratio is to reverse by 1970 so preference will be given to transfers."

From Central Michigan University,

> "We run on quotas for both Freshmen and Transfers and want to attract both, certainly in-state would have preference over out-state if there has to be a decision of this kind--i.e. when quotas are nearly filled.

III. Transfer Credits

A. Responsibility for Evaluating Transfer Credits

In an attempt to pinpoint the office responsible for transfer credit evaluation, most colleges surveyed used one or a combination of the methods listed in the chart on the following page.

5

System	No. of Responses
Admissions Office does all evaluation of both general education and technical courses	5
Admissions Office does all evaluation of both general education and technical courses that can be easily evaluated--only problem cases are referred to Industrial Education Department	12
Admissions Office does evaluation of general education courses only	2
Industrial Education Department evaluates technical courses	5
Industrial Education Department evaluates all transfer credit	2
Other (specify):	6

The responsibility for transfer credit evaluation should lie with those most qualified to do the job. Of the eight who did not follow the methods listed in the chart,

San Jose State College (California) reported:

> "Admissions evaluated all courses for unit transferability to the degree, and the general education courses for subject requirements. Department evaluates courses for meeting subject requirements in major/minor."

The University of Miami replied:

> "Academic advisor from student's major department is responsible for final validation of credits."

These valid methods provide qualified individuals both from the student's major/minor area and the admissions and/or academic office.

B. Total or Limit of Transferable Credits

Twenty seven of the colleges surveyed showed the admissions office would accept credits amounting to 50 percent of the baccalaureate degree in transfer from the community-junior college. Only eight insitutions reported that 40-49 percent of the credits were acceptable while Northern Illinois University, Chicago State College, and the State University at Buffalo (New York) ranged from 30-50 percent. This appears to be one area of articulated planning between the community-junior college and the senior institution.

C. Required Grade Point Average for Transfer Admission

Required G.P.A. for Incoming
Students at Senior Institutions

Transfer	G.P.A.		Freshmen
No. of Institutions			No. of Institutions
	1	D	
	1+	D+	
1	2-	C-	4
23	2	C	10
4	2+	C+	6
	3-	B-	2
	3	B	1
	3+	B+	
	4-	A-	
	4	A	

D. "D" Credits

Seven senior institutions reported that "D" courses were not transferable and twenty one reported that "D" courses were transferable.

E. Number of Associate Degree Transferable Credits

Fourteen of the senior institution admissions offices reported that T&I program courses--not related to A.A.S.--were not transferable. Twelve reported they would transfer non-A.A.S. courses such as trade and industrial, and apprenticeship courses.

IV. Community-Junior College Credits

A. Establishing Quality Creditability of Technical Courses at the Community-Junior College

Criteria	No. of Responses
Course description in community-junior college catalog................	23
Your general knowledge of the community-junior college...............	14
Course outline used....................	8
Qualifications of staff at community-junior college..............	5
Visit with the technical department in the community-junior college.......	14

The course outline or syllabus is probably a more realistic criteria because it is an accurate, up-to-date and comprehensive description of the course but only eight of the admissions offices used this method.

B. Methods of Evaluating Community-Junior College Technical Courses

The chart below, indicating the techniques used to evaluate community-junior college transfer students' technical courses, indicates the lack of a standard--statewide or nationwide--method of evaluation. The methods most commonly used are subjective and of little educational value if one is to be realistic. (See chart on following page).

Technique	Application
None	2
Course equivalents accepted at face value	12
Interview with individual student	13
Performance test	7
Written non-standardized test	2
Written standardized test	3

One of the most effective methods known to educators to determine how qualified a student may be for advanced or further education is through intensive evaluation by means of pre-tests. It appears that the "performance" test as listed above would meet this criteria.

V. Equivalency Sheets

Only four senior institutions reported that the industrial education department prepared the technical course equivalency sheets for courses to be approved by the admissions office. If the industrial education department is not qualified to handle this responsibility, then who is?

VI. Industrial Education Teaching Opportunities

If a main function of the community-junior college counseling staff is to assist the student in occupational direction (See section on counseling.), then the senior institutions have a significant responsibility for providing information on opportunities in specialized teaching areas such as industrial education. (See chart on the following page.)

Method	Responses	
	Yes	No
Admissions Office staff only visits community-junior colleges and talks to counselors and technical staff	12	3
Admissions Office staff with members from the specialized department visits community-junior colleges and talks to counselors and staff	15	3
Counselors from community-junior colleges are brought to campus for visit and orientation to specialized departments	17	4
Descriptive folders of specialized departments are sent to counselors	15	3
General college catalog describes specific course equivalency for general education courses	5	8
General college catalog contains information which describes in a general way the opportunities to transfer technical credits from community-junior colleges to your institution	9	6
General college catalog describes specific course equivalencies for technical courses offered in Industrial Education Department	0	11
Specific equivalency sheets showing Industrial Education Department requirements and community-junior colleges courses that meet those requirements are provided to community-junior college counselors	7	10

VII. Transfer Problems

The problem of community-junior college and senior institution articulation of industrial education transfer students is made complex by the number of people and departments involved in transfer procedures. The admissions office deals with problems unique to its area, which are listed below:

Problem	No. of Institutions with this Problem
Students come with too much concentration of credit in one technical area	12
Difficult to evaluate the quality of the work taken by transfer students in community-junior colleges	12
No way of accurately evaluating the technical competencies of transfer students from community-junior colleges	5
Difficult to plan a teacher education program with only the last two years under control of our institution	10
Transfer students from community-junior colleges lose a large amount of credit in transferring to Industrial Education programs	3
Courses taken by students in community-junior colleges do not match the courses offered by Industrial Education Department	9

It should be observed that some admissions offices had more than one major transfer problem. The problems are directly related to the fact that many students transfer from two-year terminal technical courses. The problem is frequently not the cause of improper articulation or lack of course equivalency sheets, but points directly to the student who decides to change from a two-year, non-transferable program to a four-year degree curriculum.

VIII. Articulation

Method	No. of Institutions
Using same course numbers	9
Using same course descriptions	10
Developing uniform course outline	14
Revising your institution's catalog to make it more useful to community-junior college counselors	11

In maintaining some basic form of articulation, the senior institution admissions offices were asked to respond to three seemingly elementary and necessary information areas supplied to the community-junior colleges by the senior institutions. The chart below shows these information areas and the number of responses to each. It should be made clear at this time that eleven stated other arrangements.

Information Supplied	No. of Institutions
Specific course equivalency information for all general education courses	12
Specific course equivalency sheets showing technical courses offered in the community-junior college and equivalent courses in your Industrial Education Department	4

Information Supplied	No. of Institutions
A bulletin jointly prepared by the community-junior colleges and the Industrial Education Department indicating courses which can be transferred	2

Senior institutions such as Humbolt State College (California), Illinois State University, State University College at Buffalo (New York), the University of Houston, and Sul Ross State College (Texas) reported that such information was provided only upon request.

Chico State College (California) provided the following suggestion:

"An agreement is worked out based on proposals submitted by the J.C. and approved by the Admissions (Office) and I.T."

Surveys

Counselor Questionnaire Summary

The Counselor Questionnaire was sent to all counseling directors in public community-junior colleges in the six study states. The data collection results are indicated in the chart below.

State	Number	
	Sent	Returned
California	83	58
Florida	26	24
Illinois	33	21
Michigan	27	21
New York	31	25
Texas	38	29
6-State Total	238	178

The questionnaire analyses data included in this section are as follows:

I. Counselor Functions
II. Articulation Methods
III. Recommendations for Counseling Information and Assistance

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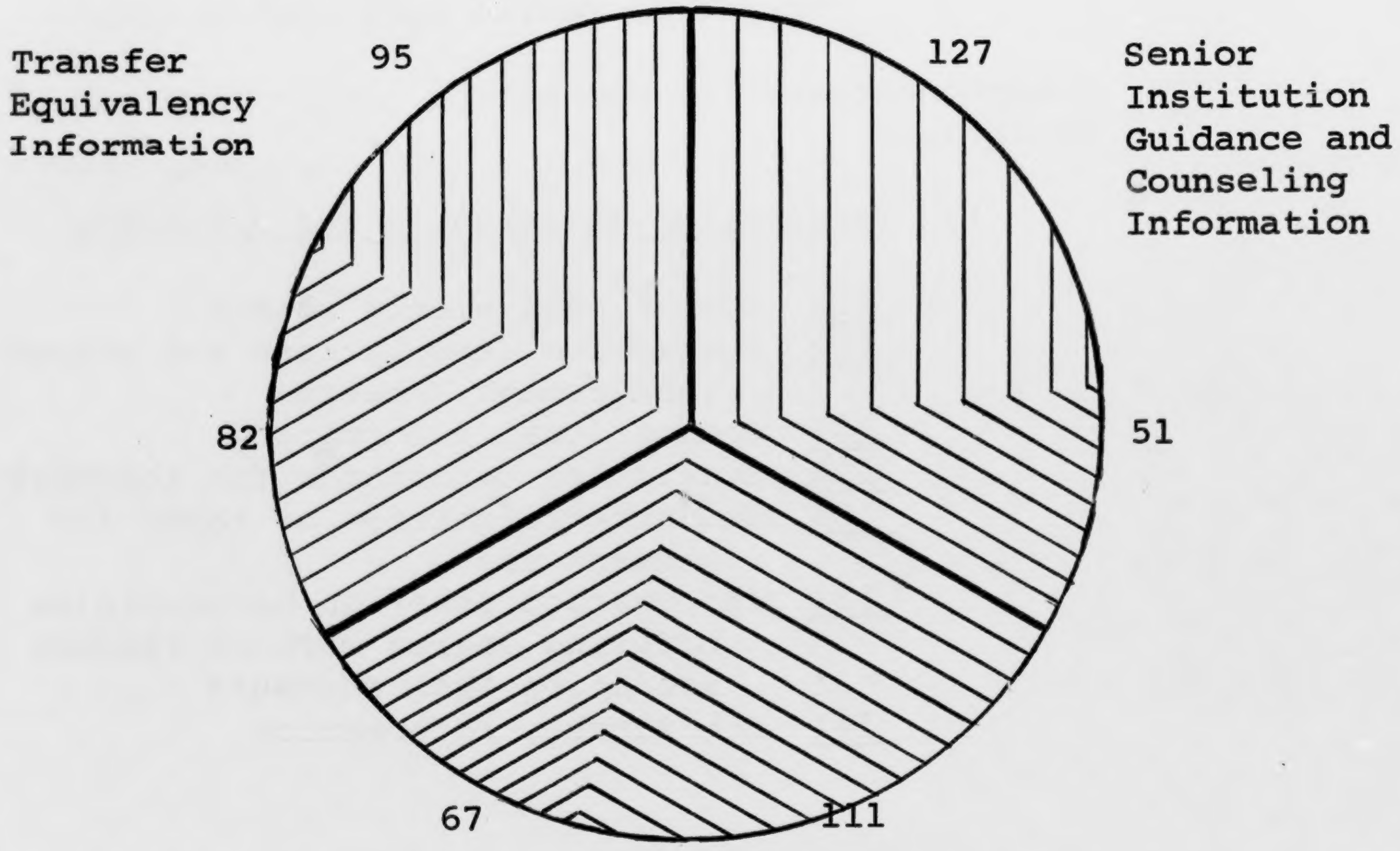
I. Counselor Functions

In 1967, a three-year projection survey was made by the Michigan State Department of Education to determine the perceptions of the counselor's role. The survey showed that student counseling was considered to be the most important function of the counselor. The role of the counselor was also conceived to be one of individual interviewing or guidance, one of dealing with academic achievement problems, vocational decisions, curriculum choice, colleges to attend, personal problems, and interpretation of test results.

The "open door" policy of the community-junior college can only achieve its goal of "student self-discovery" effectively if the colleges recognize that process as one of its principal purposes. Counselors, therefore, play an increasingly responsible part in advising, orienting, appraising, regulating, anticipating, counseling, and evaluating the students' present and future educational/occupational objectives. Correct executive of the Pyramid (Two + Two) Program is essential.



Representative Discussions of Transfer and Articulation Structure

II. Articulation Methods

Coordination of industrial teacher preparation programs within a state may be evaluated by looking at three basic channels of articulation:

One A total of 127 counselors reported yes to the question of whether or not they had been supplied with industrial education guidance information and curriculum materials from any senior institution in their respective states.

Two One-hundred eleven answered affirmatively to the question of community-junior college and senior institution representative discussions of transfer and articulation problems.

Three Only 82 counselors reported they had prepared or been supplied with industrial education course equivalency sheets.

III. Recommendations for Counseling Information and Assistance

1. Information--Literature and Brochures

153	Course equivalency sheets
152	Curriculum descriptions and course requirement sheets
143	Occupational information
120	Statistics on demands for teachers
86	Guidance filmstrips or tapes for student use
131	Information sheet on universities offering degree work in teacher education with students
141	Scholarship information

2. Personal Assistance

91	Inspection and evaluation of community-junior college courses
152	Community-junior college/university liaison
98	Better understanding of each other's goals
111	Visitations to discuss career information
100	Student visitations to industrial education departments

Surveys

Transfer Students

As a part of this investigation, it was considered necessary to examine the nature and problems of the students who transfer from community-junior colleges to senior institutions. The significance of such an investigation and the subsequent information gleaned from it cannot be overemphasized for these are the students who will be affected by the final results and recommendations of this project. It was important to learn about the academic and occupational backgrounds of these individuals, factors relating to their guidance and counseling, and the curriculums which they pursued in the community-junior college.

The questionnaire entitled, Transfer Students in Industrial-Technical Teacher Education, was sent to department heads of industrial education in the six states studied. (Names of the department heads and the institutions receiving the questionnaires were obtained from the 1967-68 and 1968-69 editions of the "Industrial Teacher Education Directory.") A sample of the questionnaire is included in the Appendix and may be referred to for clarification.

Each department head received 25 (random number) of the questionnaires along with instructions to distribute them to community-junior college transfer students presently engaged in work toward the baccalaureate degree in industrial teacher education. Consequently, the number of respondents varied tremendously among the various institutions and states. For example, there was one senior institution which offered no returns because there were no transfer students present in their program at that particular time. In other schools, the greatest percentage of the students in industrial education curriculums were transferees from community-junior colleges. This will, in some measure, explain the discrepancies and divergencies regarding numbers of respondents.

State	No. of Schools Sent	 Returned	Act. No. of Ques.
California	9	9	143
Florida	6	3	25
Illinois	7	5	49
Michigan	7*	7*	85
New York	4	4	66
Texas	11	4	49
Six-State Total	44	32	417

*Ferris State College (Michigan) had no transfer students 1968-69 school year but was included in the return figures.

In reporting the information gained through the questionnaire, the following organizational pattern was established:

I. High School or Pre-Community/Junior College Background

- A. Academic Background and Type of High School
- B. Father's Occupation
- C. Reasons for Taking High School Industrial Arts Courses
- D. Counseling in High School

II. Factors Influencing the Choice of an Industrial Education Teaching Career

- A. Influences
- B. Period in Formal Education where Influences Took Place

III. Community-Junior College Background

- A. Area of Specialization in High School and Community-Junior College
- B. Comparison of Counseling Programs
- C. Changes in Area of Specialization during Community-Junior College Education
- D. Time Gap between High School and Community-Junior College

IV. Senior Institution Educational Experience

A. Problems or Difficulties Encountered in Transfer to Senior Institution

B. Problems Encountered in Certain Academic Fields, such as Mathematics and English

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I. High or Pre-Community/Junior College Educational Background

A. Academic Background and Type of High School

Except for 128 of the total students surveyed, all beginning community-junior college students enrolled immediately after high school graduation. The majority (380) came from general high schools. Eleven came from technical high schools and 20 from vocational high schools. Although only 31 students came from technical and vocational high schools, the reader must realize that there are only a relatively small number of such schools.

Most industrial-technical education students specialized in the vocational or technical programs at the community-junior college or senior institution: 45 were enrolled in a vocational curriculum in the high school, 151 were enrolled in a general curriculum, and 226 were enrolled in a college preparatory curriculum. The number of students enrolled in the college preparatory curriculum, which leaves little or no room for industrial-technical education, was greater than the number of students enrolled in the general vocational curricula.

I. B. Father's Occupation (Percentages)

Occupational Classification		California	Florida	Illinois	Michigan	New York	Texas	
Professional, Technical Managerial		34	29	22	29	29	34	
Clerk, Sales		14	29	12	11	13	22	
Service		5			1			
Farm, Fish, Forest		5	6	14	4	2	5	
Processing		2		2	4	2		
Machine Trades		13	12	26	25	20	12	
Bench		2		2	8	2		
Structual		13	18	16	9	11	20	
Miscellaneous		13	6	7	9	25	7	

C. Reasons for Taking High School Industrial Arts Courses

A majority of the students surveyed (281) took industrial arts courses in high school because of their own interest and not because they were required. This may be an important factor for the counselors to consider in guiding students towards an industrial education career.

D. Counseling in High School

Counseling in the areas of industrial-technical occupations, student abilities and interests, and advanced industrial-technical education was inadequate and insufficient. Fewer than 47 of those surveyed received sufficient counseling in these areas.

II. Factors Influencing the Choice of an Industrial Education Teaching Career

A. Influences

The industrial-technical teacher's first responsibility should be teaching. Within this task lies a secondary one of counseling. The questionnaire indicates that the high school industrial arts teacher was "not important" as an influential individual in guiding the occupational future of the high school student. The professional high school counselor, who is supposedly trained and paid for this specific responsibility, was listed by the students as the person least influential in occupational guidance. (See the chart on the following page.)

II. A. Contd.

	Very Important	Somewhat Important	Slightly Important	Not Important
High school counselor	10	31	38	303
High school teacher	73	82	63	182
Community-junior college counselor	39	49	46	260
Community-junior college teacher	91	72	40	178
Parents	46	87	71	146
Friends	53	75	90	160
Reading	61	118	75	125
Work experience	170	98	43	66

B. Period in Formal Education Where Influences Took Place

By considering the purpose of the school to prepare students for life in a technical society, it is obvious that the community-junior college is more influential in assisting the students' decisions regarding occupational choice than the high school. Decisions at the high school were 41 and 71 at the senior institution. The decision to pursue an industrial teaching career during the community-junior college years and/or between the community-junior college and the senior institutions was made by 218 of the students.

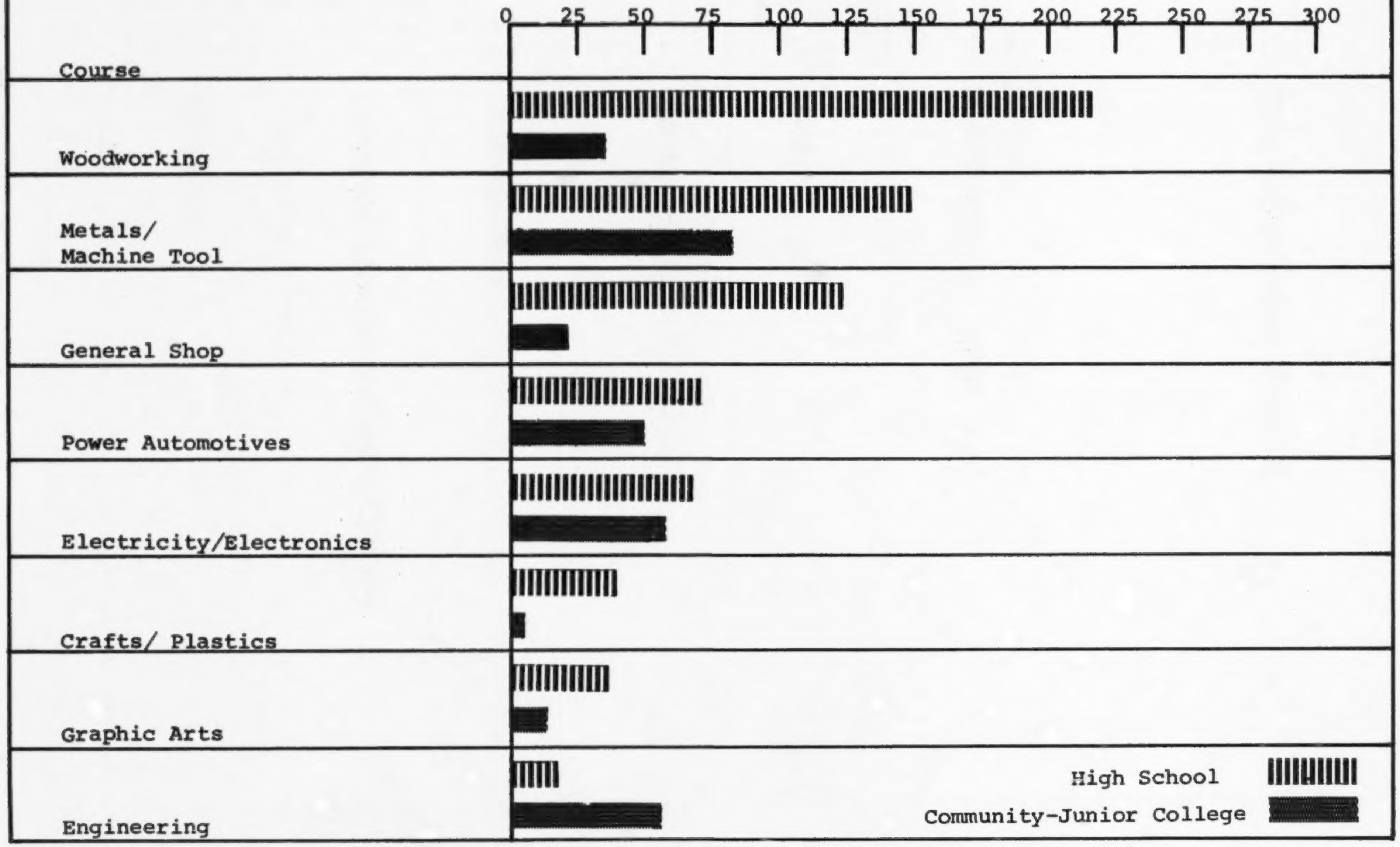
III. Community-Junior College Background

A. Area of Specialization in High School and Community-Junior College

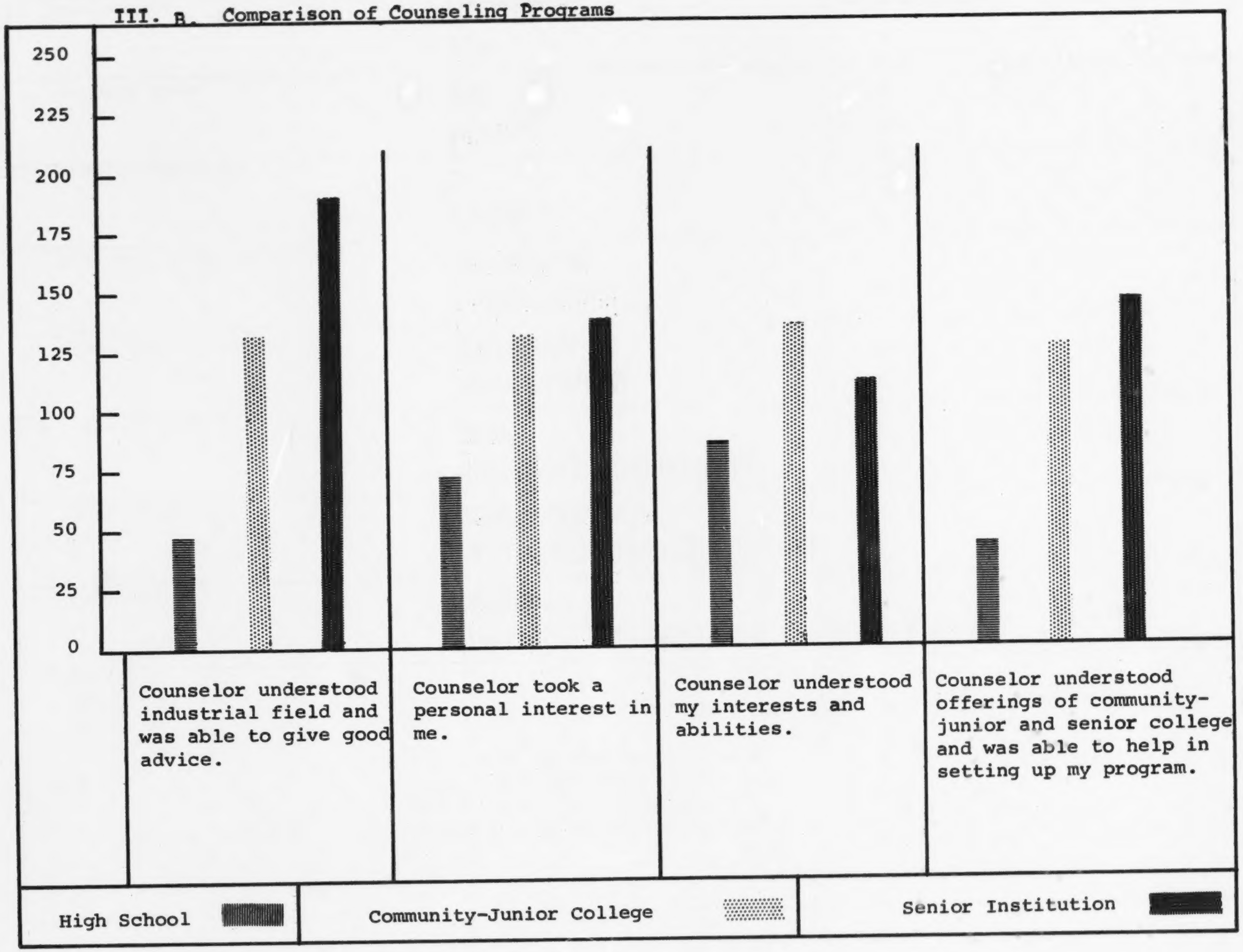
(See chart on the following page.)

III. A. Contd.

Comparison of Industrial-Technical High School Course Enrollment and Community-Junior College Area of Specialization



III. B. Comparison of Counseling Programs

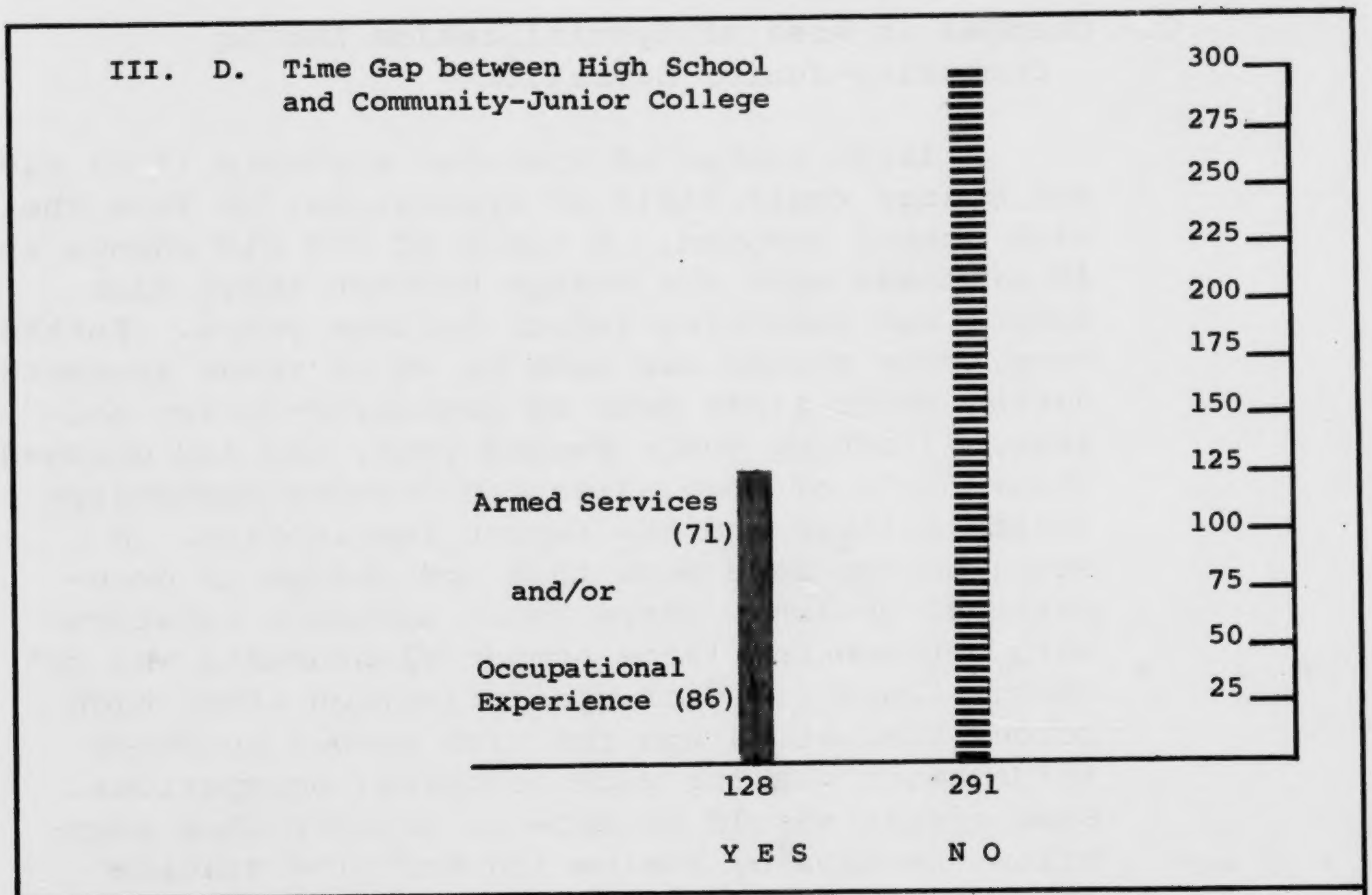


C. Changes in Area of Specialization During Community-Junior Education

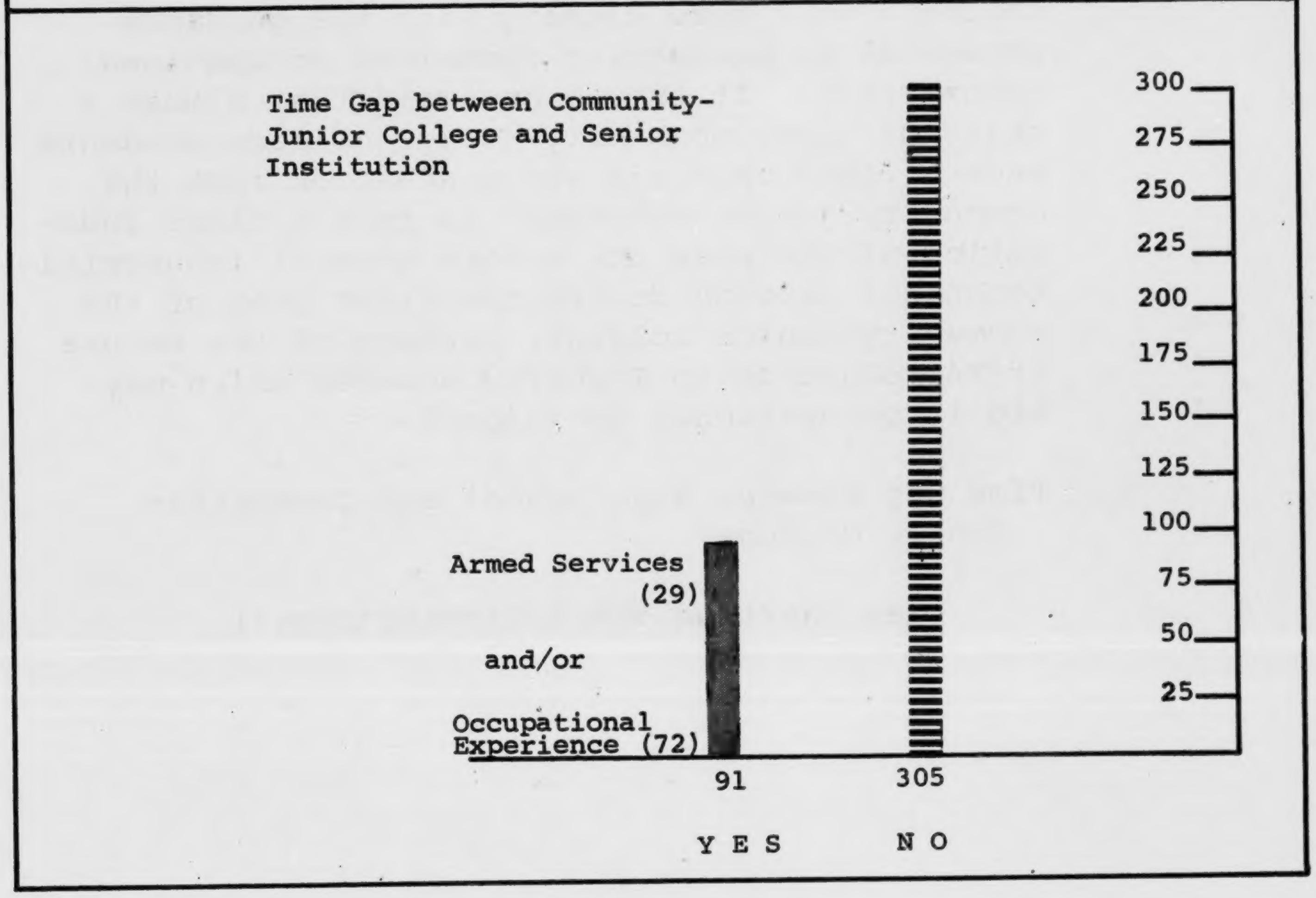
A large number of transfer students (170) did not change their field of specialization from their high school program. A total of 278 did change and 40 of these made the change between their high school and community-junior college years. Furthermore, this change was made by 48 of these students during their first year of community-junior college, 57 during their second year, and 133 changed their field of specialization between community-junior college and the senior institution. A small number made more than one change in occupational choice. There is an apparent relationship between the large number of students who do change their field of specialization after high school graduation and the high school guidance information dealing with technical occupations. Some effort should be made to rectify this situation, perhaps by having industrial education teachers work more closely with the guidance personnel in presenting technical occupational information. It should be noted that almost a third of these community-junior college students made a field change after graduation from the community-junior college. Is this a clear indication of the need for a more general industrial-technical program during the first year of the community-junior college, perhaps of the nature of "Introduction to Industry" courses which may aid in occupational decisions?

D. Time Gap Between High School and Community-Junior College

(See chart on the following page.)



III. D. Time Gap between High School and Community-Junior College



Time Gap between Community-Junior College and Senior Institution

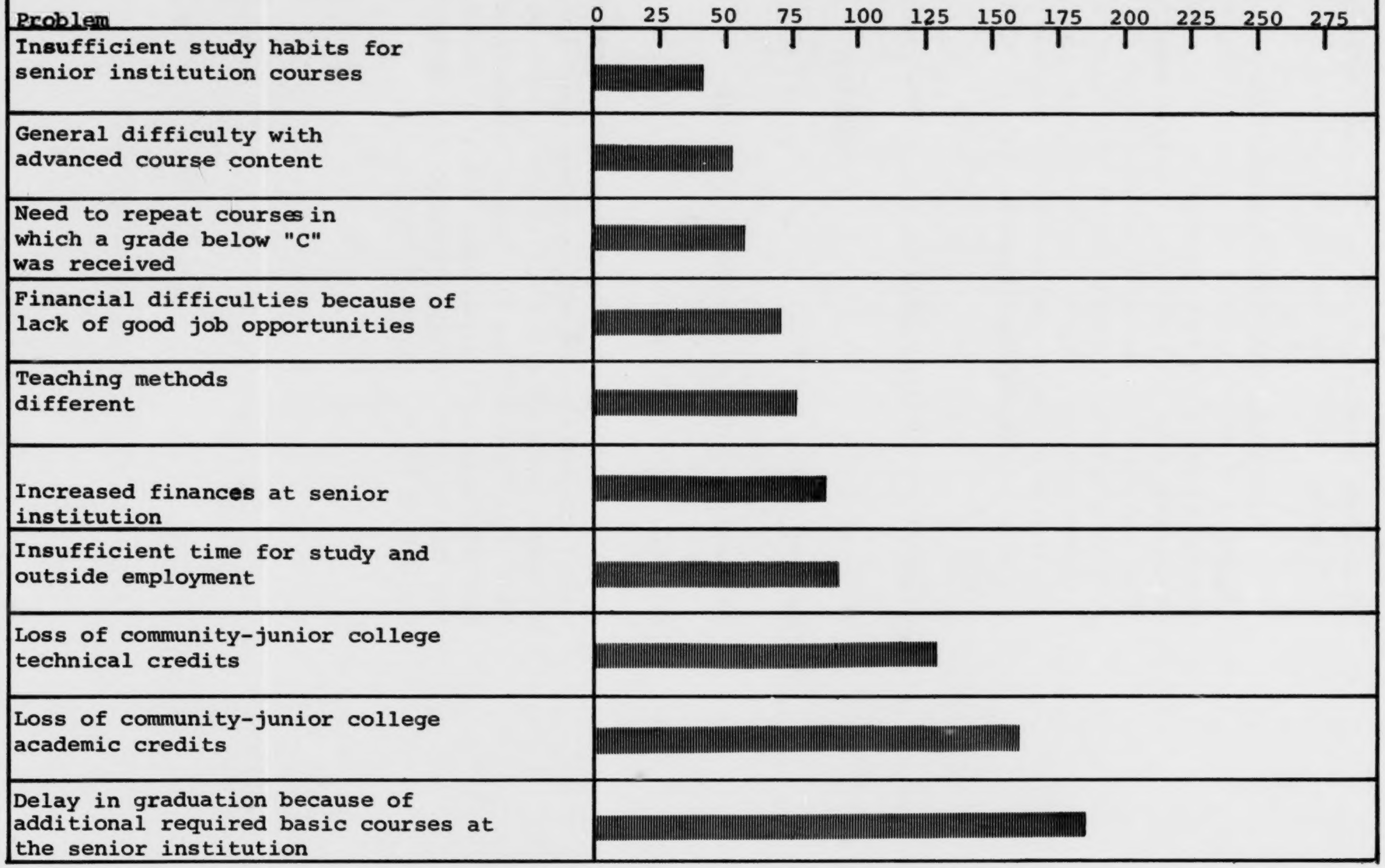
IV. Senior Institution Educational Experience

A. Problems or Difficulties Encountered in Transfer to Senior Institutions

Coordination of community-junior college and senior institution industrial-technical programs is far from being adequate or even valid in many cases. With reference to the problem difficulty chart (See the following page.), an alarming number of "credits wasted" and "financial difficulties" were reported. The tragedy within these errors is that knowledgeable counseling and coordination of the programs involved--high school, community-junior college, and senior institution--could have avoided them. Difficulties resulting from students changing from an A.A.S. degree to a B.S. degree are included in these statistics. This is a situation over which the counselor may or may not have any control. For example, an individual entering the community-junior college may "find himself" after this initial higher education experience and then discover that he finds himself dissatisfied with the two-year degree program at which he decides to embark upon a baccalaureate program. When evaluating these statistics, one must return to an examination of the responsibility of the high school counselor. During this phase of the student's education, the counselor should have been the most valid and influential resource in planning for a future industrial-technical education program.

The problems experienced by the transfer student must be carefully examined in order to ascertain those which the community-junior college and senior institution are capable of solving. Perhaps the most important of these is the loss of credits when transferring from the community-junior college to the senior institution. This can, of course, be solved by a careful guidance program, which is the responsibility of counselors in higher education; and a planned orientation program leading to an occupational choice, which is ultimately the responsibility of the individual student. He must not be permitted to make this decision in a vacuum; he must be provided with the most current and helpful information available. In addition, it might be said that one way around this impassé is to suggest that the senior institution accept all academic and technical credits transferred and that they merely require the transfer student to spend two years in the senior institution program.

IV. A. Transfer Problems Encountered at the Senior Institution



B. Problems Encountered in Certain Academic Fields, such as Mathematics and English

Although the numbers indicated on the chart are high enough to warrant some further study regarding the source of the problems, they are not so critical as one would assume. The assumption long held by those in the industrial-technical areas are that their students experience difficulties in overwhelming numbers relative to mathematics and English. This, obviously, is not the case here.

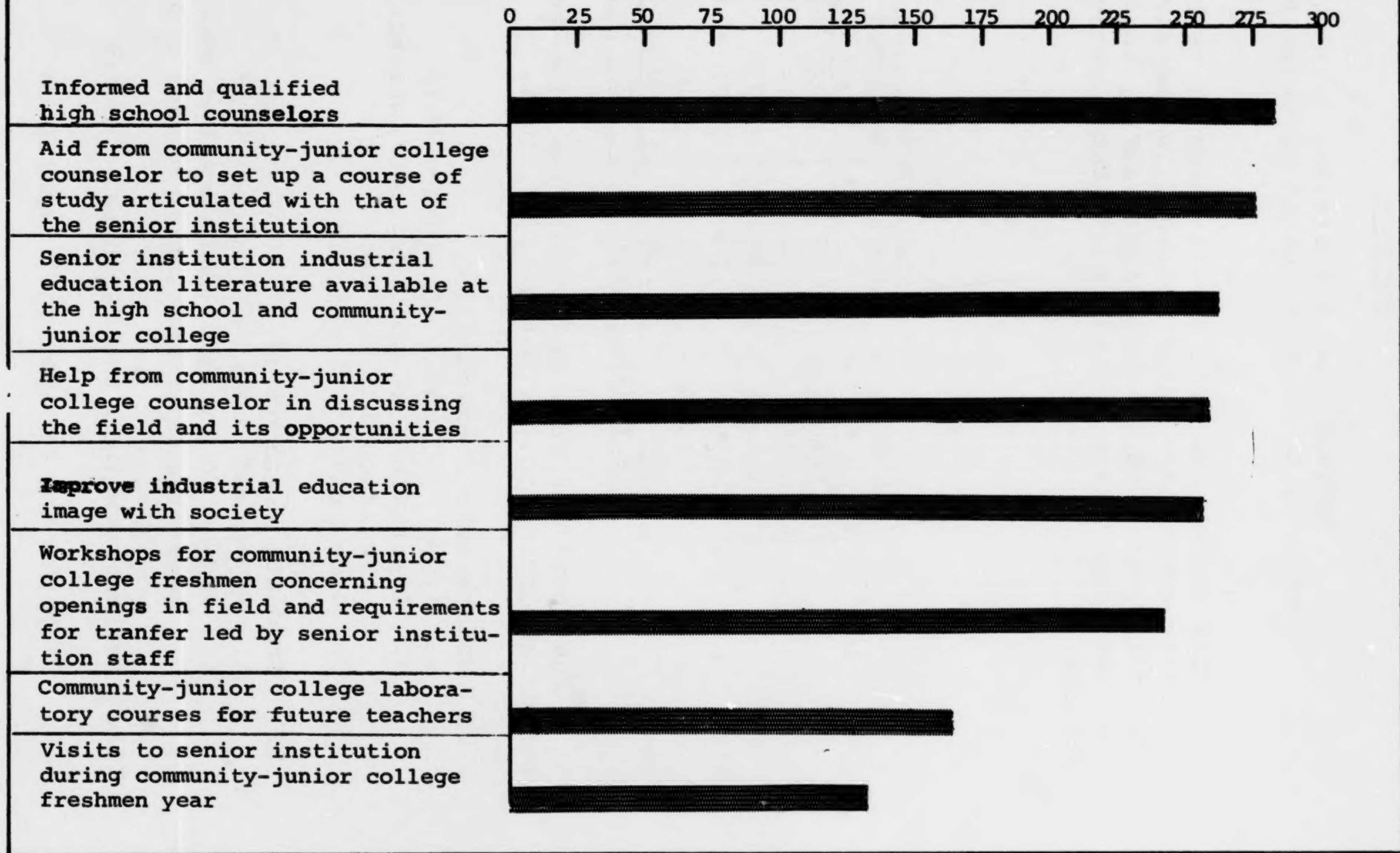
Difficulties with English and/or Math Subjects

	English	Math
High School	128	97
Community-Junior College	128	111
Senior Institution	73	71

Respondents to this questionnaire were asked to point out which questions in the accompanying chart were deemed most worthwhile. (See following page.) Their responses are significant and important to the success of any community-junior college and senior institution transfer program.

IV. B.

Suggestions for Improved Recruitment of Students into the Teaching of Industrial Education



Surveys

Professional Preparation Survey, Community College Technical Division Faculty

This survey was sent to all deans of technical studies in public community-junior colleges in the six states involved in this study. (See sample survey in Appendix.) The individual state and six-state total returns were as follows:

State	Number Sent	 Returned
California	83	28
Florida	26	16
Illinois	33	23
Michigan	27	21
New York	31	18
Texas	38	19
6-State Total	238	125

The resultant data collected from this survey is presented according to the following outline:

I. Undergraduate Preparation
  A. Types and Number of Degrees Held
  B. Instructors without Degrees Possessing Qualifying Vocational Experience
  C. Undergraduate Studies

II. Graduate Preparation
  A. Types and Number of Degrees Held
  B. Degree Comparison (Graduate and Undergraduate)
  C. Area of Specialization in Master's Degree Program

III. Engineers within the Technical Faculty

IV. Teaching and Occupational Experience

V. Additional Experience and/or Certification

VI. Sources of Community-Junior College Technical Faculty

I. Undergraduate Preparation

A. Types and Number of Degrees Held

Degrees	Number
B.S.	526
B.A.	107
B. Eng.	236
A.A.	42
B.Ed.	7
B. Arch.	20
B.B.A.	9
None	97
Others	7
TOTAL	954

B. Instructors without Degrees Possessing Qualifying Vocational Experience

One out of every ten instructors replying to this survey (97) did not have a college degree. They did, however, have qualifying occupational and professional experience. These individuals were either experienced journeymen in their trade or were registered technicians. The instructors without degrees indicated their number of years of occupational experience to be above that of the six-state average of 10.8 years. (See IV., page 299.)

C. Undergraduate Studies

MAJOR AREA	NUMBER
Industrial Education	271
Engineering	236
*Others	118
Engineering Technology	52
Vocational Education	48
Architecture	29
*Included with"others" are Technical Education, Education, Automotives, and Electronics	

II. Graduate Preparation

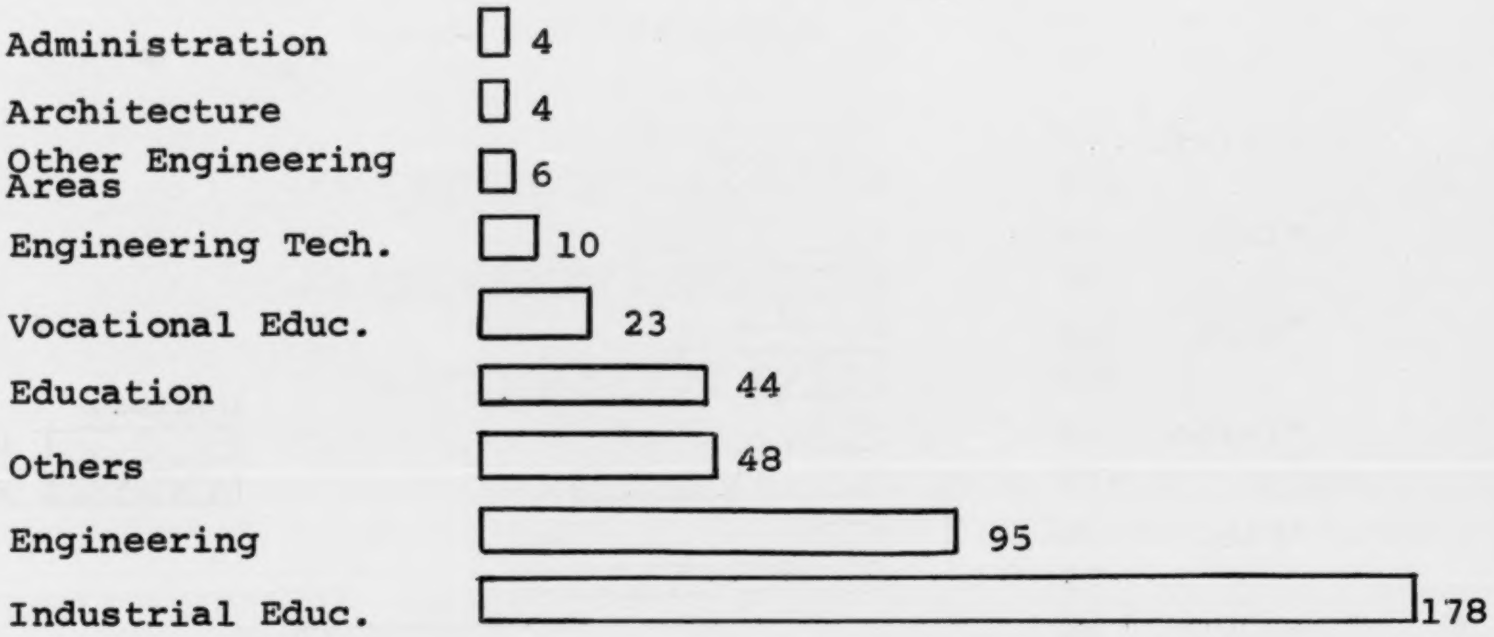
A. Types and Number of Degrees Held

The Degree	Number
Master of Arts	166
Master of Science	164
Master in Education	58
Master in Engineering	43
Master in Business Administration	6
Others	2

B. Degree Comparison (Graduate and Undergraduate)

A total of 439 technical teachers held the master's degree compared to 820 who held the bachelor's degree.

C. Area of specialization in Master's Degree Program

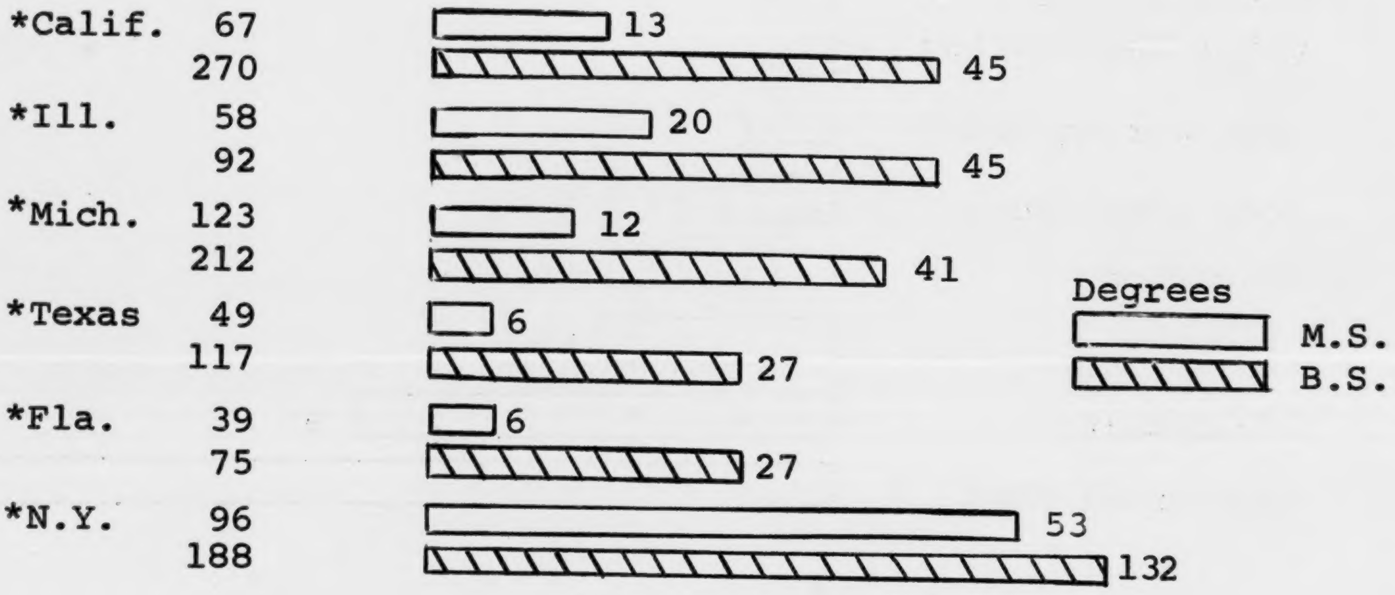


III. Engineers within the Technical Faculty

ENGINEERING DEGREES

Undergraduate Bachelor's		Graduate Master's	
Architecture	29	Architecture	4
Technology (Eng.)	52	Technology (Eng.)	10
Engineering	236	Engineering	95
		Other Eng. Areas	1
	317		110

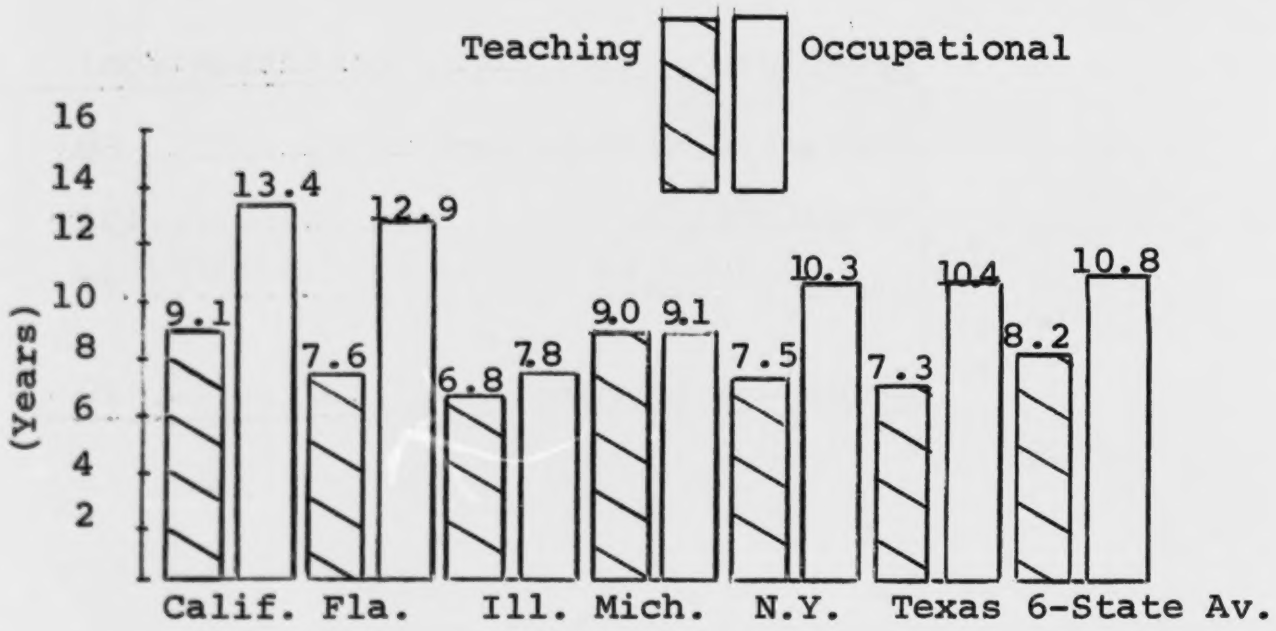
Distribution of Engineering Degrees
within the Six States



*Total Degrees within Each State Including Engineering

IV. Teaching and Occupational Experience

The average community-junior college technical teacher in this survey had more occupational than teaching experience. It should be noted, however, that it is common practice for community-junior college technical faculty to consider part-time and summer employment as full-time occupational experience.



V. Additional Experience and/or Certification

The survey illustrated that 735 of the community-junior college technical faculty have additional professional experience and/or specialized certification beside the bachelor and/or master degree. This factor is of special importance in making any evaluation of the competencies of the community-junior college technical staff.

Examples of Additional Certification:

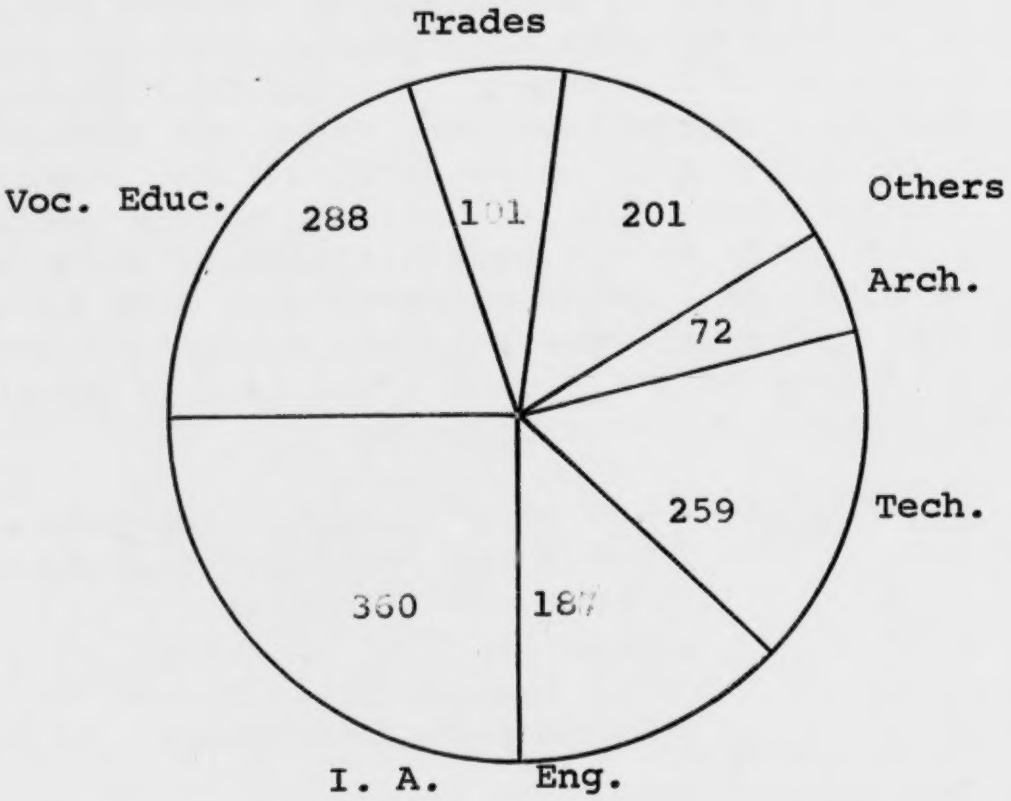
Professional Engineer	60
Vocational	493
Architectural	27
Trade Journeyman	20

VI. Sources of Community-Junior College Technical Faculty

Less than 40% of those surveyed held degrees in industrial-vocational, technical, or industrial arts education. The majority (891) do not have teacher education training backgrounds.

This information is significant because it identifies an area which may require in-service or pre-service training; namely, in the area of teaching theory and methodology. One must not make the mistake of assuming that because an individual had a graduate degree in a specific area and also has a most satisfactory record regarding work and professional experience that he automatically becomes a good community-junior college technical teacher. This is a topic of special concern to the dean of technical studies.

Backgrounds of Technical Faculty
(Graduate and Undergraduate)



SECTION THREE
PREPARATION OF THE GUIDELINE BULLETIN

Organization of the Work-Study Conference

Purpose of the Conference

The overriding purpose of this work-study conference was to develop a format and materials for the guideline bulletin referred to in Section One. It was felt that valuable information and new ideas would be forthcoming if a group of interested individuals, each possessing high qualifications relative to their specialties, could meet to exchange ideas in a planning session over an extended period of time. To achieve this goal, a group of some 30 individuals were invited to meet at Western Michigan University from May 12-16, 1969, for the express purpose of planning such a bulletin.

Selection of Personnel

Well before this project started, and increasingly after it got underway, certain individuals in participating states were identified as being vitally interested in this project. It was gratifying to discover that so many people were willing to cooperate in solving the problems relative to the transfer of students from the community-junior college to the senior institution. While each state had some unique problems, there was also great similarity among their major difficulties. Numerous personal contacts were made at conferences and meetings to alert individuals to the possibilities of their attending such a conference. Other contacts were made by mail or telephone; and as the pre-planning procedures for the conference drew to a close, a final list of participants emerged. The list is as follows:

California-----Mr. James Allison, Supervisor
Trade and Technical Education
State of California
Department of Education
721 Capitol Mall
Sacramento, California 95814

California contd.

Dr. Melvin L. Barlow
Professor of Education,
Director Division of Vocational Education
University of California
131 Moore Hall
Los Angeles, California 90024

Dr. Ralph C. Bohn
Chairman, Department of Industrial Studies and Associate Dean of Educational Services
San Jose State College
San Jose, California 95114

Florida

Mr. Ernest B. Heiny
Area Supervisor of Industrial Education
State Department of Education
10712 Edgewater Lane
Tampa, Florida 33612

Dr. George Mehallis
Director, Technical, Vocational, and Semi-Professional Studies
Miami-Dade Junior College
11380 Northwest 27 Avenue
Miami, Florida 33167

Dr. Hobdy Perkins
Associate Professor of Industrial Education and Technology
Omega College, University of West Florida
Pensacola, Florida 32504

Mr. Richard D. Ray
Program Specialist for Technical Education
State Department of Education
Tallahassee, Florida

Dr. Ralph V. Steeb
Consultant, Industrial Arts
State Department of Education
Tallahassee, Florida 32304

Illinois

Mr. Jerry S. Dobrovolny
Professor and Head of Department
Department of General Engineering
Room 115 Transportation Building
University of Illinois
Urbana, Illinois 61801

Dr. Charles R. Hill
Director, Ford Project for the Preparation
of Teachers of Two-Year Post High School
Occupational Programs
Junior College District of St. Louis,
St. Louis County
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Clayton, Missouri 63105

Dr. Charles B. Porter
Dean, College of Applied Science and Technology
Illinois State University
Normal, Illinois 61761

Mr. Bernard Quigley
Consultant, Research Coordinating Unit
405 Centennial Building
Springfield, Illinois 62706

Michigan

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Department of Education
Division of Vocational Education
Box 928
Lansing, Michigan 48904

Mr. Bruce Kocher, Dean of Students
Kalamazoo Valley Community College
6767 West "O" Avenue
Kalamazoo, Michigan 49001

Dr. Cameron W. Lambe
Associate Professor of Education
Department of Teacher Education
Western Michigan University
Kalamazoo, Michigan 49001

Mr. Frederick R. Whims
Higher Education Consultant
Bureau of Higher Education
P.O. Box 420
Lansing, Michigan 48902

New York

Dr. John C. Briscoe,
Consultant in Technical Education
New York State Education Department
State Education Annex, Room 1066
Albany, New York 12224

Dr. Robert E. Buxton
Director, Industrial Arts Education
Buffalo State University College
1300 Elmwood Avenue
Buffalo, New York 14222

Mr. Justice M. Cheney
Associate Professor
Vocational Technical Teacher Education
State University College at Oswego
Sheldon Hall
Oswego, New York 13126

Texas

Dr. Everett R. Glazener
Professor and Head of Industrial Education Department
Texas A&M University
College Station, Texas 77843

Dr. Joseph D. Godsey
Director, Vocational Program Development Post Secondary
Texas Education Agency
Capitol Station
Austin, Texas 78711

Mr. Truman Isbell
Director, Technical Vocational Studies
Brazosport Junior College
1400 Velasco Boulevard
Freeport, Texas 77541

Others

Dr. Lewis R. Fibel, Executive Director
Maryland State Board for Community Colleges
2200 Somerville Road
Parole Office Center
Annapolis, Maryland 21401 (Formerly with the American Association of Junior Colleges)

Mr. Rolf Anselm
1002 South Franklin Avenue
Flint, Michigan 48503

Others contd.

Mr. Allen A. Raymond, President
The Management Publishing Group
22 West Putnam Avenue
Greenwich, Connecticut 06830

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The W.E. Upjohn Institute for Employment Research
Suite 905
1101 17th Street, N.W.
Washington, D.C. 20036

Dr. E. Earl Wright
W.E. Upjohn Institute for Employment Research
300 S. Westnedge
Kalamazoo, Michigan

Mr. Lewis F. Nicolini,
Regional Manpower Administrator
Room 2402 Federal Building
219 South Dearborn Street
Chicago, Illinois 60604

Dr. Sidney High, Assistant Director
Educational Resources Development
Division of Adult and Vocational Research
U.S. Office of Education
Washington, D.C. 20202

Mr. William L. Lewis, Regional Director
Vocational-Technical Division
U.S. Office of Education
226 West Jackson Building
Chicago, Illinois 60606

Pre-Conference Information Materials

In order to familiarize each of the conference participants with the project, an orientation packet was prepared and disseminated to these individuals. The packet contained abbreviated reviews of literature and summaries of available survey data for the following topics:

a. Department Head Questionnaire
b. Staff
c. Professional Preparation Survey
    Community College Technical Division Faculty
d. Guidance and Counseling
e. Community College Counselor Survey
f. Admission and Transfer

g. Admissions Office Survey
h. Transfer Students
i. Transfer Student in Industrial-Technical Education Questionnaire

It was emphasized that the enclosed data were but brief descriptions, and complete, extended analyses for each of the categories was available for study at the conference. The information packet was designed to provide the conferees with background information to identify the kinds of research materials that had been collected by the project directors and to permit them to start thinking about a suitable format for the guideline bulletin.

The Conference Schedule

It is to be noted from the schedule shown below that the conference was planned in a very logical fashion. First there were presented some position papers on topics identified as being sufficiently important to warrant a serious examination. Following the position papers, there was an opportunity for reactions from other conference participants which led to a rather fruitful exchange in each case. At the conclusion of the position paper presentation, two of the members of the group commented upon the overall approach to the problems at hand offering some constructive criticisms and alternative courses of action. The final event for the first day was the orientation to group assignments. Prior to their arrival on the Western Michigan University Campus, each individual had been notified of his assignment to a study group. These study groups were organized and staffed according to the interests and qualifications of conference participants. A group leader was identified for each, and the responsibilities of the group were outlined and discussed. The remainder of the conference was given over to small group study sessions, interspersed with meaningful and appropriate position papers, reactions, and research. Ample time was given to the study groups to prepare their information to consult with other individuals, and to get their materials into a final form. The last day of the conference was devoted to group reports and reactions from the rest of the participants. Prior to their departure, the group chairmen left corrected copies of the final group reports with the project directors. Further information relative to the group reports can be found under the section entitled--Conference Proceedings (Study Group Reports).

WORK-STUDY CONFERENCE

Tentative Schedule
May 12-16, 1969

Monday -	9:00 - 9:30	Coffee and Introductions
	9:30 - 10:00	Orientation - Feirer
	10:00 - 10:15	Position Paper - Barlow
	10:15 - 10:30	Position Paper - Bohn
	10:30 - 11:00	Reactions
	11:00 - 11:30	Position Paper - Fibel
	11:30 - 12:00	Reactions
	12:00 - 1:30	Lunch
	1:30 - 2:00	Position Paper - Mehallis
	2:00 - 2:30	Reactions
	2:30 - 2:45	Commentary - Nicolini
	2:45 - 3:00	Commentary - Fine
	3:00 - 3:30	Reactions
	3:30 - 4:00	Orientation to Group Assignments
	Adjourn	
	Social Hour and Dinner	
Tuesday -	9:00 - 10:30	Group Study
	10:30 - 12:00	Conference Business - Discussion of Bulletin
	12:00 - 1:30	Lunch
	1:30 - 2:00	Position Paper - Hill
	2:00 - 2:30	Reactions
	2:30 - 2:45	Position Paper - Lambe
	2:45 - 3:00	Position Paper - Kocher
	3:00 - 3:30	Reactions
	3:30 - 4:00	Group Study
	Adjourn	
Wednesday-	9:00 - 9:30	Position Paper - Dobrovolny
	9:30 - 10:00	Reactions
	10:00 - 12:00	Group Study
	12:00 - 1:30	Lunch
	1:30 - 2:30	Conference Business - Problems
	2:30 - 4:00	Group Study
	Adjourn	
Thursday -	9:00 - 12:00	Group Study
	12:00 - 1:30	Lunch
	1:30 - 2:00	Conference Business
	2:00 - 4:00	Group Study
	Adjourn	
	Dinner	
Friday -	9:00 - 9:30	Conference Business-Further Research
	9:30 - 12:00	Group Work
	12:00 - 1:30	Lunch
	1:30 - 3:00	Conference Summary
	Adjourn	

Conference Proceedings--Position Papers Read

Supply, Demand, and Recruiting Practices for Vocational-Industrial-Technical Teachers

Melvin L. Barlow

Agreement can be reached quickly about the three major elements of the problem: (1) the supply of teachers is low, (2) the demand is high, and (3) teachers are hard to find. Despite such agreement what we actually know about supply, demand, and recruitment consists of a mixture of fact, fiction, and emotion. The quantity of written materials, such as articles in professional journals, indicates a depth of concern about the problem. The quantity of research about the teacher problem indicates a determination to find relevant data. The next major step is to make optimum determinations of what to do about the problem, and then to move immediately into action programs which will in fact tend to solve the problem.

Principles Related to the Problem

In its historical context vocational-industrial-technical education developed in part from the desire of leaders in manual training and manual arts to do something positive about the specific needs of people who wanted to prepare for work. In part, the development of vocational-industrial-technical aspects of education was an expression of social and economic need. In both of these cases the intent was to provide skills and knowledges related to a particular occupation (or a cluster or group of occupations) and designed to provide access to immediate employment.

In order to accomplish these aims it was conceded that the instructor must have had actual work experience in the occupation he was to teach. This gives rise to the first principle--the instructor must have had actual work experience in the occupation to be taught, and he must be occupationally competent. In no way could pseudo, artificial, or simulated experiences (regardless of quality) be substituted totally for actual work experience.

The second principle concerns the professional training of the occupationally competent prospective teacher. Despite the values of subject matter competency such quality does not assure teaching competency. Therefore, great stress has been placed upon developing quality in the art of teaching.

The third basic principle is related to in-service training. The occupationally competent instructor who has had some experience and study in the art of teaching must (1) have an opportunity to upgrade and update his knowledge in his occupational area, (2) continue to teach himself how to teach by adapting the newer methods and techniques of instruction.

These three basic principles--occupational competency, professional training as a teacher, and in-service training--are as old as the vocational education movement. The principles are valid today and nothing in the furor of automation, technological growth, and educational expansion indicates that the principles are not sound. However, change does have an affect upon how these principles are implemented. Repeating this particular and important point--the principles are sound, but implementation in the "modern context" is exceedingly important.

Current Background Data[1]

Long term manpower projections show significant and variable growth. The need for teachers is influenced in a large measure by population changes and by the effect of the economy upon certain occupational areas. Thus different approaches are needed to identify potential need for teachers. All occupations are not similarly affected by the changes taking place in industry. (VT 001 854, ED 016 057)

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[1] In preparation of this paper the ERIC system was searched for the purpose of locating, on a nationwide basis, the research and professional papers related to the topic of supply, demand, recruitment, and training of vocational-technical teachers. The rationale which follows has been gleaned from these sources.

Seven factors point-up the urgency of the demand for vocational-technical teachers: (1) the simple factor of growth, (2) the wide range of individuals which must now be served in vocational education, (3) demands for increased quantity and quality of teacher preparation, (4) new developments in teaching technology and methods, (5) the newer fields to be served, (6) new dimensions of activities which must become a part of the programs--(A) occupational orientation of younger students and their parents, (B) need for specialists in work-study and cooperative work experience education, (C) teachers are needed to provide short, intensive entry-skills program, (D) specialists who can help youngsters make the transition from school to work--(7) teachers of the disadvantaged. (VT 005 627, ED 020 431)

The use of examinations to evaluate the occupational competency of prospective teachers has long been employed in trade and industrial education. But there has been no uniform national pattern or procedure. Some states employ a combination of written and performance tests; others use a written examination only; and yet other states, unfortunately the majority, have developed no comprehensive system for evaluating vocational skills and knowledges. There is a growing national trend identifying the need for trade proficiency tests that would be available on a national scale. (VT 005 039, ED 016 874)

A plan designed to explore the feasibility of developing a computerized system to match military retirees to job vacancies for teachers and other support personnel in vocational and technical education has been developed. The system shows that there are thousands of military retirees who are occupationally and educationally qualified for vocational teaching positions. Although the system is feasible the plan has not been implemented. (VT 005 039, ED 016 874, see also VT 004 279)

One of the problems related to effective staffing for vocational education is attention to the wide range of duties of the local director of vocational education. In the long run the quality of vocational education is dependent upon the director of vocational education and how well he performs his duties. The vocational education director is the administrator, the supervisor of instruction, and the liaison officer with outside agencies.

He is also responsible for the periodic evaluation of his local program. (VT 003 295, ED 016 072)

Demand for vocational and technical education teachers for the period 1965-1968 was reported in terms of percentage increase from 1965 to 1968. These estimates, for 48 states, were as follows:

High School	
Agriculture	5.3%
Business and Office	28.0%
Distributive Education	49.2%
Home Economics	13.7%
Trade and Industrial	43.1%
Post-High School	
Agriculture	113.0%
Business and Office	37.0%
Distributive Education	73.5%
Health Occupations	40.2%
Home Economics	66.0%
Technical Education	39.7%
Trade and Industrial	23.2%

(VT 002 210)

If the present dropout rate continues it will border upon economic suicide for many young people. Studies show that in communities where students were not offered adequate vocational programs, the dropout rate was three times as high, and the unemployment rate was eight times as high as in areas with such educational opportunities. (VT 001 353)

Subjective estimates indicate that the demand for occupational teachers will exceed the supply. Increased federal funding in the area of vocational education has increased the demand for teachers. The numbers of teachers from collegiate programs are inadequate to meet the demand. Teachers from business and industry will be used more extensively to fill the needs for full-time and part-time teachers. Objective date available about teacher supply and demand usually reflects only a small local or geographical area. (VT 003 262, ED 015 265)

College or university programs which combine work experience and academic preparation leading to certification and a bachelor of science degree are relatively new.

A recent report--Project COPE--indicates the rationale behind this program. ("Blazing a New Trail in the Training of Trade and Industrial Teachers," *School Shop*, January 1969, pp. 46-7.)

A variety of in-service teacher training programs, supported by EPDA funds, indicates that during the summer of 1969 and throughout the academic year 1969-70, a total of 21 states, the District of Columbia, and Puerto Rico will focus attention upon teacher training. (*School Shop*, February 1969, p. 62)

Characteristics of Trade and Technical Teachers

Information about the actual characteristics of trade and technical teachers has been reported only occasionally in the literature. National summary data is almost non-existent and such data as are available sheds little light upon the nature of the present supply of teachers. From time to time some states have reported data about their teachers but usually such data represents a view at a particular time and does not provide information about trends.

Realizing that depth analysis of trade and technical teachers was essential to provide guidelines for change in teacher education, the California State Department of Education, Bureau of Industrial Education, and the Division of Vocational Education, University of California, embarked upon a two-year study of teachers during the period 1966-68. The following data, gleaned from reports of these studies provide a variety of information about the California teachers.[2]

Overall population studies		2,238
Males	72.5%	
Females	27.5%	
Median age at start of teaching		36.7 years.
Median age of study group		45.5 years.
Years of work experience prior to teaching		13.5

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2. Melvin L. Barlow & Bruce Reinhart. *Profiles of Trade and Technical Teachers*: Summary Report, 1968, Revised.

Where Do They Teach?

Junior College	63.3%
High School	15.4%
Correctional Institution	9.4%
Other	9.0%
No Answer	2.9%

Large Town or City	55.6%
Small Independent Town	26.6%
Suburb	12.0%
No Answer	5.8%

Trends--Educational Achievement At the Start of Teaching

	1953	1962	1967
High School Diploma	59.9%	38.7%	15.9%
Bachelors Degree	16.1	24.2	29.3
Masters Degree	4.8	8.1	4.9
Doctors Degree	0.2	0.4	1.2

Current Enrollment in Educational Programs		Anticipated
Junior College Courses	7%	2%
Junior College Degree	2	3
Extension College Courses	17	12
Non-Extension College Courses	7	13
Bachelors Degree	5	24
Masters Degree	7	22
Doctors Degree	2	6

Educational Achievement--Study Group

High School Diploma	6%
Junior College Courses	13%
Junior College Degree	67%
R.N.	3%
Non-Extension College Courses	25%
Bachelors Degree	29%
Masters Degree	16%
Doctors Degree	2%

What Do Teachers Teach?

Major Subject Areas	Percent of Overall Population
Practical nursing	14.7
Automotive	11.0
Electrical-electronics	9.9
Drafting	6.6
Machine shop	5.8
Cosmetology	4.2
Printing	3.6
Peace Officer	3.5
Carpentry	3.4
Welding	3.3
Dental	3.1
Medical	3.0
Foods	2.9
Aircraft	2.8
Sewing	2.1
Photography	1.2
Architectural landscaping	1.1
Radio-television	1.1
Sheet metal	1.1
Air conditioning, heating and refrigeration	1.0

(less than 1% not shown)

What is Appreciated Most in Pre-Service Preparation?

- Demonstrations by master teachers
- Practice in actual instruction
- Emphasis on methods and techniques related to subjects
- Help in lesson planning
- Help in curriculum development

What do Teachers Suggest for In-Service Training?

- Workshops and seminars for specific subject areas should be provided.
- Industrial organizations and institutions of higher education should sponsor in-service training.
- Latest information in the trade and technical fields should be disseminated.
- Master teachers should be employed for in-service instruction.
- Training for vocational counseling should be provided for teachers and counselors.
- Sound methods of instruction should be taught and demonstrated.
- Central responsibility, direction, coordination, and communication for in-service training should be established.
- Credit should be provided on the salary schedules of school districts for in-service training.

Suggested Action for the Future

Anticipated growth of the program of vocational-industrial-technical education is such that attention to teacher supply, demand, recruiting, and training is urgent and critical. It is a national problem and some facets of the problem must be solved on a national basis. However, a majority of the action programs are problems which must be solved on a state or local basis. In some instances, particularly small states which do not have a variety of resources, regional treatment of teacher training is appropriate.

One inescapable fact about vocational education--and one that keeps getting lost, or ignored--is that quality depends upon the teacher-student contact. All other elements, buildings, equipment, salaries, supplies, administrative and supervisory services, and other similar items exist only to support the teacher-student relationship. The Teacher, and what he does for the student, are in the long run the essential elements in the program. This situation is not new and it is not unique to vocational education. What is new is that never before has massive attention to the teacher as one of the essential elements in the process been so important. We need more and better teachers to deal effectively with a wider variety of students from the socio-economic structure.

The basic principles involved in the supply, demand, and training of vocational-technical teachers will be the same.

1. Occupationally competent teachers who have had a direct relationship with the world of work and who have been certified as occupationally competent.

2. Professional training as a teacher which includes the best up-to-date methodology, and which is sensitive to the needs of a wider variety of students from the socio-economic structure.

3. Continuous in-service training programs involving both an occupational element and a professional teaching element.

The task confronting teacher educators at the present is not to change the basic principles, but to devise more appropriate means to implement the principles. The following actions, with no order of importance intended, can be included in the tasks for the future.

- In-service training for the beginning teachers. This should be a flexible program which will bridge the gap from the prospective teacher's previous employment to vocational teaching. The person recruited directly from industry with no teaching experience needs a different treatment than the experienced teacher who is also occupationally competent.

- In-service teacher training for teachers who have met the minimum requirements for teaching and who have been teaching for a period of time. This type of in-service training includes attention to the new technical developments in the occupation and the newer technology in the art of teaching and includes an updating based upon research in teaching and learning.
- Pre-service teacher training which leads to the bachelors and/or masters degrees and which includes an occupational experience component. Such programs must lead to certification and employment as a vocational education teacher.
- Professional programs leading to the bachelor's and master's degrees for vocational teachers who entered teaching prior to completing such programs.
- New flexible certification requirements designed to accommodate a wider potential source of vocational-technical teachers.
- A national center for vocational teacher educators similar in design to the center for the study of the behavioral sciences or other such centers, where the emphasis is upon depth study in the area of teacher education.
- A series of national and regional annual conferences which focus upon both general and special problems related to teacher education.

Position Paper

Focus on the Problem:
Supply, Demand and Recruiting Practices for Industrial Arts Teachers

Ralph C. Bohn

At best, the teacher education institutions of the United States are producing only fifty per cent (50%) of the industrial arts teachers needed each year. The critical shortage created by this 1:2 ratio between supply and demand has been the topic of numerous papers and speeches. Stories and cliches of hiring practices brought about by frustration produced by this shortage help emphasize the serious nature of the crisis.

> One large city school district will hire, without interview or review of transcripts or confidential papers, every industrial arts teacher education graduate from any industrial arts program--action based on desperation rather than confidence in all teacher education programs.
>
> Other large city schools find it almost impossible to hire any qualified industrial arts teachers.

Nearly all graduates, regardless of qualifications, have a choice of ten (10) or more teaching positions. They could have more if they wish. For the graduating teacher, the job placement market is excellent. For the profession, the shortage is a near disaster since school districts and states have been forced to either close programs or use emergency credentials to place sub-standard teachers in the classroom.

Supply and Demand

The statistical reports on the teacher shortage can be misleading due to the duplication of requests among many colleges and universities. Most large school districts list their available teaching positions with all teacher education programs in both their own and adjoining states.

As a result, states such as Michigan can report requests for 8,000 new industrial education teachers in one year. Many teacher education programs report that their placement office receives 1,000-2,000 requests for industrial arts teachers each year. Obviously, the need is not the sum total of all requests. A review of available statistics provides the following analyses:

1. In 1962-63, there were 40,000 industrial arts teachers in the United States.[1] This number has been increasing each year. The best estimate of the U.S. Office of Education and the American Industrial Arts Association indicates that there are close to 50,000 industrial arts teachers now in service.

2. On the average, the teaching profession has a ten per cent (10%) turnover each year. Industrial arts has held to this average. Reasons for the turnover include retirement, death, advancement out of the classroom, and resignation to take other positions--industry, government, etc.

3. Using a base of 50,000 teachers with a ten per cent (10%) turnover rate produces a need of 5,000 industrial arts teachers each year plus the 1,000 to 2,000 teachers needed for new programs (the growth rate of the profession).

4. In 1964-65, a total of 3,670 bachelor's degrees were issued by industrial arts teacher education programs.[2] Approximately seventy per cent (70%) of industrial arts teacher education graduates enter the teaching profession.[3] These two statistics produce an estimated 2,570 industrial arts teachers entering the profession.

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[1] Marshall L. Schmitt and Albert L. Pelley, Industrial Arts Education, A Survey of Programs, Teachers, Students, Curriculum, USOE, Government Pringing Office, 1966, p. 12.

[2] G.S. Wall, "Some Interesting Facts Concerning Industrial Teacher Education," Journal of Industrial Teacher Education, Vol. 5, No. 2, Winter, 1967, p. 28.

[3] Committee on Education Finance, Financial Status of the Public Schools, National Education Association, 1968, p.25.

5. It should be noted that the number of graduates includes "on-the-job teachers" hired without degrees, but already in the profession. As a result, the actual number of new teachers is somewhat less than 2,500.

6. In summation, at least 5,000 industrial arts teachers are needed each year, but less than 2,500 are entering the profession for the first time, a supply/demand radio of 1:2 (or less).

This shortage has been in existence, at various levels, for more than a decade. The last known period of balance between supply and demand was between 1950-55. Since that time, supply has been less than demand.

Effects of Teacher Shortage

The effects of this shortage are far reaching. Sub-standard teachers enter and leave the profession without every reaching minimum qualifications. The 2,500 teachers listed as entering the profession include many sub-standard teachers who have finally reached minimum standards. If all were reaching minimum standards, the number of degrees granted should be sufficient to produce over 5,000 teachers each year.

Many states have drastically lowered credential standards in order to permit districts to hire teachers for industrial arts. California, for example, now permits a person with seven (7) years of industrial experience to teach industrial arts. Through a pair of "delayed requirement clauses," all formal collegiate education may be delayed in order to place the teacher in the classroom. While a bachelor's degree with eighteen (18) units of upper division industrial arts is eventually required, it is possible to teach ten (10) or more years without formal instruction in industrial arts.

Other states have had to adopt similar emergency provisions. Most districts avoid using these emergency clauses as long as possible. In many cases, however, they must make a decision between closing the industrial arts program or hiring a sub-standard teacher.

Ten (10) plus years of this teacher shortage has already had a serious effect on the curriculum aspirations of the industrial arts profession. For a number of decades, industrial arts has held to a philosophy of general education which includes broad based instruction emphasizing the interrelationship of industrial materials, processes, and mechanisms. A number of curriculum studies have identified instructional patterns which are designed to help all young people live and profit within our industrial society. The implementation of these programs is difficult and requires the best possible education. With half or more teachers entering the profession with little or no special instruction in industrial arts, educational change is difficult, if not impossible to implement. Quality instruction in such areas as industrial materials, industrial processes, graphic and industrial communications, power mechanics, and electricity/electronics is only possible with teachers who have received excellent instruction in collegiate programs. The only other way society can prepare these teachers is through self study or extensive in-service education programs. Self study at this level is rare, and in-service education is nearly nonexistent in the majority of school systems.

As a result, the solving of the teacher shortage is the first step which must be taken to improve and upgrade industrial arts instruction in American education.

Solving the Teacher Shortage--Recruitment

As mentioned earlier, the problems related to the teacher shortage have been considered on many occasions. If simple solutions were possible, they would have been discovered long ago. We have passed through "the circle of responsibility" where the industrial arts supervisors say junior and senior colleges are not recruiting properly, the colleges indicate the high schools are not providing good candidates, and the high school teachers say the supervisors have not provided adequate equipment and working conditions in order to present desirable working conditions to the potential candidates.

While this passing of responsibility does not solve the problem, it does identify some of the methods tried in the past.

Recruitment Publications. Many states and colleges have developed brochures which encourage young men to select industrial arts education as a career. These publications are a necessary part of every recruitment program. They should be well planned and truthful, providing the prospective candidate with the factual information he needs to evaluate industrial arts teaching as a career.

This is not a difficult task and each college and state department can, with a modest budget, prepare a recruitment brochure which will encourage young men to enter the profession. The brochure, however, is only a small part of a good recruitment program. *It must be used to support a strong personal campaign*.

Personal Involvement. Most people choose careers after having some level of personal contact with members of the profession they are entering. They may gain initial information from a brochure but will inevitably seek advice from a member of the profession.

It is, therefore, at this personal involvement level that we must concentrate our efforts. The colleges and univerisities can provide open house functions, visit high schools and junior colleges, and maintain an "open door policy" for all prospective industrial arts teachers. Supervisors can encourage their teachers to cooperate with the teacher education programs and to actively recruit potential teachers. The main responsibility must, however, remain with the people who have the most direct contact with prospective teachers--*the secondary school teacher and the junior college teacher*, as well as guidance counselors.

Most teacher education programs can identify schools from which they regularly receive candidates. At San Jose, one junior college provides ten (10) or more teaching candidates each year. A closer and larger junior college (with an exceptionally large industrial education program) rarely provides a candidate. The difference is not the students, but the guidance provided the students by their teachers and counselors. Similar parallels can be drawn for high schools.

Many high school industrial arts and vocational industrial programs attract a minimum number of college bound students. Recruitment efforts in these programs are severely handicapped. On the other hand, high schools conducting pre-collegiate programs of industrial arts have an excellent opportunity to make the students aware of the possibility and procedures for becoming an industrial arts teacher.

Community-Junior College Involvement. The most fertile recruitment areas for obtaining industrial arts teachers is the community-junior college. If the present trend continues, most students who obtain a four (4) year collegiate degree will spend their first year or first two (2) years in a community-junior college. It is during this time that previous career decisions will be evaluated, and students undecided about a career will seriously evaluate the choices available to them. The industrial arts profession must, therefore, do everything it can to provide junior colleges with the information they need, and encourage junior college personnel to provide positive and favorable guidance for careers as industrial arts teachers.

The community-junior colleges also have a vested interest in industrial arts teacher education programs. First, industrial arts is an important career area in colleges and universities. Second, many of the industrial-technical teachers at community-junior colleges have industrial arts degrees, or have studied in industrial arts programs.

As community-junior colleges evaluate hiring practices, the requirement of collegiate degrees for all faculty will become common practice. Many community-junior colleges already refuse to hire full-time faculty members who do not possess a bachelor's or master's degree, even though qualified through a vocational credential. As this practice becomes more common, serious efforts must be made to identify collegiate programs which provide instructional programs designed to prepare industrial-technical teachers for the community-junior college program. In many institutions, the industrial arts department will be the place where these degree programs are established.

The need to center recruitment programs for industrial arts teachers in the community-junior colleges emphasizes the importance of the project for which this paper is being prepared. The project titled "A Pre-Teacher Industrial Education Development Proposal for Community-Junior Colleges" is planned to develop pre-teaching programs of instruction. Once established, students will have the opportunity to select and begin programs leading to industrial arts teaching while still in junior college.

A number of community-junior colleges already have programs of this type. Those that do not are being encouraged to develop programs. In California, Dr. Robert Woodward, State Consultant for Industrial Arts, is conducting a series of community college work sessions titled "Articulation of Industrial Arts Teacher Preparation with the Community Colleges and State Colleges." The first of these conferences was held on March 28, 1969 and was well represented by community-junior college personnel.

The establishment of a transfer program does not fulfill the responsibility of the community-junior college. Students must be encouraged to investigate the program and, if their aptitude and interests are appropriate, encouraged to become an industrial arts teacher.

Additional Recruitment Practices. The main recruitment efforts of the profession should be directed towards young people during the time they are choosing a career. One excellent source of candidates from this group has not been mentioned--recruitment from other collegiate programs on campus.

Many college students become disillusioned with their career choice. This disillusionment may result from lack of needed abilities, lack of opportunity within the profession they chose, or simply changing their minds based on additional information. Regardless of the cause, many students on campus are seeking new careers. The industrial arts teacher education programs should make a concerted effort to acquaint these students with the opportunities, needs, qualifications, and advantages of becoming an industrial arts teacher. A well planned recruitment program should exist at both the community-junior college and the four (4) year college for students from other majors.

Besides young people, the profession should look to people who are completing one career and still young enough to enter another career as well as those who wish to leave their present positions.

Large numbers of military people are retiring with twenty (20) years of service. Many of these are below forty (40) or in their early forties (40s) and are seeking a new career. Their military experience is often related to industrial arts teacher education. As a result, a strong recruitment program directed towards this group can and has produced excellent results. The government is very receptive towards recruitment programs planned for those they retire.

Many people working in business and industry become disillusioned with their positions. When this happens, they become candidates for a recruitment program. If they are community-junior college or senior college graduates, and if they have an instructional background of industrial arts or industrial technology, the possibility of recruitment becomes favorable.

The major handicap for these people is the time which must be invested into a collegiate program in order to obtain a credential. The problems are complex, but flexibility should be possible to provide instruction to supplement the person's background, without studying subjects he already knows. There is also the danger of assuming too much knowledge, or of recruiting people unable to succeed in their former career and who may become poor candidates for a teaching career. Evening programs and part-time attendance are usually necessary since the person must continue to support his family.

Recruitment Handicaps

The recruitment problem could be solved if all of the handicaps were removed. Since salary, the major handicap, is not likely to be removed due to its financial implications, we must proceed with recruitment despite the handicaps placed before us.

Salary. This is the most critical handicap faced by the entire teaching profession. The United States is enjoying unprecedented prosperity, coupled with inflation. Teachers' salaries have not kept pace with the increased prosperity and standard of living. This is a common occurence during inflationary periods.

The solution is not easy. Increased demands for more and better public services, the recognition of special needs of minority groups, and our military and defense needs are straining our present tax structure.

With approximately one and one half per cent (1½%) of our population engaged in the teaching profession (all levels plus administration), a raise across the nation of ten per cent (10%) would require around two and one half (2½) billion dollars (based on an estimated mean salary of $8,000). It is doubtful whether a raise of anything less than twenty per cent (20%) would have a significant effect on the recruitment of teachers. Is our government able and willing to provide an additional five (5) billion dollars for teachers' salaries?

Recognition. Even though industrial arts is officially recognized as a regular part of the general education program in our schools, it still suffers from lack of equal recognition. Industrial arts is often the subject suggested for poor students and misfits. It then takes on the identity of this group of students.

Industrial arts is also an applied area, and as an applied science and art, is not accepted by the traditional liberal arts specialists.

The solution is difficult. We must "hang our hat of respectability" on our excellent pre-collegiate programs while recognizing the services we provide for all students in the school. We must also work for a recognition of the applied sciences and arts based upon the fact that application follows theory, and must be built upon sound knowledge. In the final analysis, the successful industrial arts student must first understand the theory, and then use the theory in practice.

Additional Handicaps. This list can be quite extensive. However, most of the additional handicaps are secondary to the pair mentioned above. This list includes the difficulty of obtaining time for recruitment, the fact that industrial arts is a high cost program at all levels of instruction, the inadequacy of many teacher education programs, the problem of relationship of industrial arts and vocational-industrial education, the difficulty of keeping the profession up-to-date with the new knowledge teachers need, and the inadequacy of many secondary school programs of industrial arts.

Articulation Problems Between Industrial Art Community-Junior and Four-Year Colleges

Solutions to recruitment handicaps and a progressive program of recruitment must be carried on simultaneously. One of the most important area of recruitment centers in the development of a progressive and active two-year pre-industrial arts teacher education program in the community-junior colleges. The establishment of this program faces many articulation problems. I would like to complete this paper by outlining and briefly analyzing some of these problems.

1. Terminal Courses. Many community-junior colleges identify certain courses for two (2) year terminal students only. Practices vary significantly, but these courses often include science, mathematics, English, and five to eight (5-8) unit technical courses. These courses are often taught at a different level of instruction than the transfer courses, or have content which is deemed unnecessary to a transfer program. The reasons for the practice are acceptable, but an unexpected burden is placed on the student when he decides to change his objective from terminal to a four (4) year degree. The direct or indirect loss of these units can extend his time in college by one (1) or more semesters. The full significance of terminal courses should be explained early so the student is aware of losses which might occur if he changes his objective.

Naturally, a more desirable solution would have terminal students take courses that can be transferred whenever possible.

2. Change of Major. Students starting or completing one (1) major in the community college usually lose units when changing to a different major. This condition is brought about by changes in course requirements. A common and often costly change occurs when a student completes an AA degree in a vocational-industrial area and then decides to complete a four (4) year degree program. Each student should be encouraged and counseled to make, if possible, an accurate determination of degree objectives early in his college career. If he has the ability to complete a four (4) year degree, his interest in a terminal program should be evaluated carefully and appropriate counsel provided.

3. Loss of Credit. This is probably the most severe problem facing articulation plans between community and four (4) year colleges. We have found that transfer students usually spend one additional semester in college beyond that of students starting in the four (4) year college as freshmen.

Improved articulation between community-junior colleges and four (4) year colleges is needed to eliminate this added time to the greatest possible extent.

4. Division of the Major. Most articulation meetings between community-junior colleges and four (4) year colleges start or end (sometimes both) on the question of course equivalents and the total question of instruction in the major.

On the one hand, community-junior colleges indicate that they can offer any course that the four (4) year college can offer. This position cannot be contested successfully. Most community-junior colleges have extensive laboratory facilities and a pay structure which permits them to compete successfully with four (4) year colleges for faculty.

On the other hand, four (4) year colleges indicate that they are the ones carrying the responsibility of success or failure after the student graduates. Also, they argue that in depth specialization should occur just prior to graduation and should, therefore, be reserved for the four (4) year college.

An answer to this question of equivalency must be found wherever it remains as a problem. The final solution must be based upon the curriculum plans and sequences which give first consideration to the needs of the student.

5. Mixed Standards. Grading practices and academic standards often vary between community-junior colleges and four (4) year colleges. This variation causes some adjustment problems for students when they transfer.

6. Multiple Articulation. The problems of articulation are compounded by the freedom four (4) year colleges exercise in curriculum planning and the freedom the students have in transferring to the school of their choice. The end result is that each community-junior college must try to articulate their programs with a number of four (4) year colleges, with each four (4) year college often having individual requirements for the same degree.

The near impossibility of this task becomes apparent with consideration of the fact that community-junior colleges usually have one fourth (¼) or less the student population of the four (4) year college. To some extent, the size of the student body controls the number and variety of course offerings available.

A Suggested Step Towards Solution

No panacea for this complex problem is apparent. However, more order than now exists is a necessity.

The first step towards solution is the establishment of some basic formats, within states, for degree programs. Four (4) year colleges should exercise their freedom in curriculum planning during the program planned for the last two (2) years rather than the first two (2) years. The first two (2) years should be very consistent throughout the state, and jointly planned by community and four (4) year college groups.

In industrial arts teacher education, this division may follow this pattern:

1. Community-Junior College Program

    a. General and liberal education = forty-five (45) units. This program should include necessary study in English, social sciences, speech, psychology, sociology, chemistry, physics, mathematics, art, and other general and liberal education subjects deemed necessary.

b. Industrial arts technical courses = fifteen to twenty (15-20) units. This program should include a broad based introduction to the total study of industry. Subject areas which should be included are industrial processes, industrial materials, power mechanics, electricity/electronics, and graphics communications. This program should be carefully planned by a joint committee of community and four (4) year college personnel. Emphasis should be placed on the identification of the required units of instruction. The format, additions, and interpretations must be left to the discretion of the community-junior college faculty.

c. (a) and (b) account for sixty to sixty-five (60-65) units, half of a one hundred twenty-four (124) unit degree major. Variations in this format might include:

    (1) Study in a minor--if required for teaching.

    (2) Initial specialization in a subject area (such as two (2) courses in electricity/electronics) to encourage and maintain student interest.

    (3) Initial course in professional education to introduce student to the teaching profession.

d. Any additions from the list in (c) should be made with an appropriate reduction in list (a) and (b). A balance of sixty to seventy (60-70) units in the community-junior college and an equal number of units in the four (4) year college should be maintained.

2. Four-Year College Program.

    a. Industrial arts technical major = twenty to twenty-five (20-25) units. This program should provide the subject area specialization, to the needed extent, plus individual content variations the department wishes included.

    b. Industrial arts and professional education courses = thirty (30) units. This program includes the professional education sequence (psychology, evaluation, etc.), special industrial arts professional courses (methods, curriculum, etc.) and student teaching.

    c. Special emphasis and electives = ten to fifteen (10-15) units. Special requirements for the major (additional art, design, or science courses), innovative programs, and free electives.

    d. (a), (b), and (c) account for sixty to sixty-five (60-65) units, half of an one hundred twenty-four (124) unit degree major. Variations in the format might include:

        (1) Study in a minor--if required.

        (2) Other division of units, based on student needs as interpreted by the faculty and students.

Once a format is established and agreed upon, the first step is complete. The actual format is at the discretion of the planning group. The one listed represents my current position on a division of responsibility.

The second step requires a liberalizing of the transfer policy. Once a reasonable and logical format has been established, the community-junior college must decide whether they will offer all or part of their half of the program.

Transfer should be permitted as soon as the student completes all the courses available within the program assigned for the first two (2) years. This permits a new or small community-junior college to offer a large variety of transfer programs with a minimum number of course offerings. If a small school could only offer the general/liberal education sequence to start, students could transfer after forty-five (45) units. The four (4) year college would have to provide the more specific instruction. As the community college grows, they can expand their offerings, eventually offering a full two (2) year transfer program.

The key to success of this program is the assignment and acceptance of specific curriculum responsibilities. Standards are maintained by accreditation rather than by the four (4) year college trying to evaluate for equivalent courses. The relationship should be one of mutual cooperation, with each fulfilling a portion of the program, rather than control and evaluation by one of the two (2) cooperating institutions. This procedure can only be successful if each institution sees and accepts the rationale of two (2) institutions cooperating in a four (4) year instructional program.

Position Paper

Curriculum Planning In The Community Junior Colleges As It Relates To Teacher Preparation In The Senior Institutions

George Mehallis

Perhaps the most major impact on higher education in the past decade has been the development of community junior colleges. Today these colleges rank as the fastest growing branch of higher education, most of which are multi-purpose institutions.

The major educational divisions usually found in these institutions are divided into four groups, namely, pre-professional, liberal arts, technical and vocational. The preponderant number of students are enrolled in two-year transfer programs, which is the primary mission. Those programs (pre-professional and liberal arts) are comparable to those offered in the first and second years of most four-year colleges and universities.

A second but important mission of most community junior colleges is the occupational programs (technical, vocational) which prepares one for employment and re-training to meet technological needs. These occupational programs usually reflect needed competencies in business, industry and the professions within a community. It is to these occupational programs and particularly the technical or engineering related ones that we must look to in order to help alleviate the shortage of industrial-technical teachers. One needs but to take note of the number of shops or laboratories that remain closed throughout the nation each year because of the lack of qualified teachers to confirm the critical need for teachers of this broad discipline.

Although many community junior colleges offer pre-teacher education programs, very few offer a pre-teaching program in a specialized area such as industrial arts education. A recent survey in Michigan indicated two pre-industrial teacher education programs in their twelve community junior colleges. A telephone survey revealed only one in Florida's 29 community junior colleges. The result of these surveys additionally showed that while the demand for industrial, vocational and technical teachers has increased substantially, the four-year colleges and universities do not reflect a comparable increase in the number of qualified students enrolled in teacher education programs in industrial education. In fact, it appears that the development of the community junior colleges has had a negative effect on the growth of enrollments in industrial education teacher preparation. The same pattern has also been true in Florida's four industrial education teacher training programs. It is assumed that the reason for this is students electing technical-vocational programs that enable them to become more readily employed.

We need then to focus on this problem, a way to improve and increase the supply of technical, vocational and industrial arts teachers throughout the nation. It is thus imperative that a program of articulation be developed with baccalaureate degree granting institutions. This then would enable students interested in teaching technical subjects to obtain one or two years in a junior college and then transfer to a four-year college or university. It is inherently imperative that such an educational program be designed and articulated to enable the student to complete his baccalaureate degree in four years without appreciable loss of time, credit, or quality of preparation.

In the development of such a program several issues or problems have been cited relative to curriculum planning in the community junior college. First, how does the quality and quantity of vocational programs in community junior colleges affect the industrial teacher preparation in each state? Naturally, the larger community colleges are more likely to have a greater diversity of occupational program offerings, while the smaller colleges would have somewhat limited program offerings. We can probably further assume that the larger community junior colleges would have better staff dedicated to specialty programs, while the smaller colleges would have to utilize their staff over a broader spectrum of programs. Accordingly, the larger community junior colleges are more likely to have a greater diversity of program offerings that articulate with comparable courses offered at senior institutions. In this articulation, many courses relate well within the broad philosophy of industrial arts. Quality of faculty does not appear to be a basic problem

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in states where certification is required of junior and community colleges. This certification (as in Florida) somewhat assures the program of quality personnel. In other states not requiring certification, regional accreditation or specialized accreditation (i.e., ECPD) may aid in the assurance of qualified teachers.

Secondly, in most cases, the philosophy of the community junior colleges' occupational programs are justified only on the basis of community needs reflecting business, industry and the professions in a defined area constituting the community. These programs are usually developed through the extensive use of advisory committees which identify competencies sought in a particular industry or technology. Thus, while these programs are primarily designed to meet local needs, many are forced to serve the needs of the state and nation and are consequently reflected within the broad philosophy of industrial arts.

The third issue of great concern to many community junior colleges is the feasibility itself of the development of a pre-industrial teacher curriculum. Although many junior colleges offer a pre-education program, very few offer a specialized program leading to a major in industrial education. Thinking in terms of the broad spectrum of discipline involved in the average industrial education program, it would be very difficult for a student to complete the baccalaureate degree in two years at a senior institution without having taken at least some introductory courses at the junior college. Hence, it would be feasible to develop a pre-industrial arts teacher curriculum which may be offered at the junior college level. (See suggested program).

It is generally agreed between junior colleges and senior institutions that courses at the 300 and 400 level (or those normally taught in the junior and senior years) should be taught at senior institutions only. This means that most of the professional education courses (methods, internship, etc.) would be offered by the senior institutions. Thus, it is fair to postulate that the student taking the pre-industrial education program and then transferring to a senior institution would be better prepared to teach industrial arts as we know it philosophically, its mission being exploratory in nature. The student, however, who has taken the technical associate degree, should he pursue a teaching baccalaureate degree, will be more of a specialist and would probably be more successful as a teacher in a particular discipline in a technical institute, vocational high school or unit shop in a comprehensive high school.

If it is feasible to develop a pre-industrial teacher curriculum, the next issue is relative to whether or not the curriculum should be limited to non-technical or introductory technical courses. In exploring this issue we need to examine a typical technical curriculum to determine how we can possibly arituclate it towards advanced study or the baccalaureate degree. Most two-year technical programs require that a student earn between 60 to 70 credit hours for an associate degree. Approximately one-fourth of his program will delve with general education courses (communications, social sciences, humanities), another fourth in mathematics and science courses usually related to his specialized major and the remaining 50 percent of his work devoted to technical courses. Upon completion of his program, it is assumed the student is a marketable product. But what if he chooses to continue his education--where can he transfer without appreciable loss of credit?

Senior institutions need to concern themselves with this type of student. Perhaps a program leading to a Bachelor of Technology degree would be feasible. Such a program would involve designing an "inverted curriculum" where the student would take the balance of his general education work and other professional or major courses required of the baccalaureate degree at a senior institution. Because of this heavy concentration of course work in a specific discipline this student may well prepare himself for teaching in a large, comprehensive high school offering a diversity of industrial education programs. Whether or not the student could meet certification requirements would depend largely on how stringently the state certification regulations were adhered to.

The senior institutions should also give some consideration to initiating a work experience program such as a co-op program common in many colleges today. The student could then gain experience in his chosen discipline while attending a four-year college in alternating terms. He could thus possibly qualify himself for a technical teaching certificate in states that require experience and the baccalaureate degree. The experience gained under such a co-op program would somewhat insure that the student does not become an obsolete teacher in his specialty particularly if his chosen specialty reflects the fast change of pace common in today's technology.

Another feasible plan which may warrant consideration, closely related to the co-op concept, would be the development of a program whereby the community junior college graduate could serve as a Teacher Aide in an industrial arts or technical program part-time and take required course work to matriculate towards the baccalaureate degree. This teacher aide work experience could very well take the place of an internship or practice teaching requirement provided it was structured and supervised properly and supplemented with necessary pedagogical course work on the campus. Such a plan could provide an alternative to "years of experience" often required for certification.

In addition to the aforementioned suggestions, greater impetus should be given by both junior colleges and senior institutions in granting credit by examination. At present approximately 40 leading colleges and universities have some plan for using trade competency examinations for granting college credit for experience gained in industry. This credit often serves as an incentive to enter teaching in affording a shorter route toward a degree. Inherent in this however, the problem often arises that should the junior college grant such credit, will the senior institution accept these credits toward the bachelors degree?

These then are some of the major problems in the development of a practical way to improve and increase the supply of technical, vocational and industrial arts teachers throughout the nation. That any problem at all should exist is almost inconceivable. These problems have arisen in the very atmosphere of the most major impact on higher education that this nation has seen in the past decade--the evolvement of the junior college where innovation is the byword. Nonetheless the problem exists and, as a consequence, both the four-year institutions and the junior colleges lose their most precious commodity--enrollments; the student suffers in being deprived of a baccalaureate degree--the pathway to his desired field of endeavor; industry ultimately suffers; and finally, those institutions utilizing the industrial arts teachers suffer, for they are deprived of their ability to effectively discharge their primary obligation to society.

The resolution of the basic problem then falls to you in the academic world--the solution being the development of a functional integrated curriculum.

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Suggested Program
Pre-Teaching Industrial Education Major
For Junior/Community Colleges

Freshman Year

First Term		Second Term	
Course Name	Cr. Hrs.	Course Name	Cr. Hrs.
Orientation	1	English	3
English	3	General Psychology	3
Intro. to Education	3	Physics I	3
Engineering Drawing I	3	Engineering Drawing II	3
Graphic Arts	3	Manufacturing Tech.	3
Mathematics	3	Physical Education	1
	16		16

Sophomore Year

First Term		Second Term	
Course Name	Cr. Hrs.	Course Name	Cr. Hrs.
Humanities	3	Humanities	3
Educational Psychology	3	Speech	3
Physics II	3	Electronics II	3
Electronics I	3	Architectural Drawing I	3
Social Science	3	Social Science	3
Physical Education	1		15
	16		

Position Paper

Articulation of Courses and Curricula
for
Industrial Teacher Preparation

Charles R. Hill

> "Ask almost any professional in the field of community college education what bothers him most and he will tell you that it is the low prestige value or lack of acceptance of technical education. In this country and in many countries abroad the university with its baccalaureate programs is the desired educational objective. Technical programs are chosen often reluctantly as second best options."[1]

This was the beginning of a speech on technical education and society by Dr. Edmund Gleazer, Executive Director of the American Association of Junior Colleges, that was presented in St. Louis about three years ago. The theme is not new to us. The same situation still exists today. Unfortunately, there are many persons who hold the view that in order for one to achieve success, he must first complete a bachelor's degree. The view is held not only by parents but also by many teachers, counselors and school administrators. The feeling is that it's better for everyone to "shoot high", for at least nothing is lost; because without the "degree" a person is not going anywhere career-wise any way. The result, according to Dr. Gleazer, is that of the students entering community colleges in the United States, approximately two-thirds say that their educational goal is a baccalaurate degree. At this point many would feel proud of the wise educational choices that are being made, but before we decide, let us examine one important detail - the yield. Of the two-thirds who start bachelor degrees about one-third transfer to a four-year college.[2] In other words, the attrition is about two-thirds. The reaction of some to this alarming situation is that those who fail to achieve their educational goal lack the capacity to do so. Few of us would agree that this is the main reason. Failure is due in many cases to the fact that students fail to see how the required courses relate to their end goals.

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[1] Gleazer, Edmund J. Jr., "Occupational Education and Society", Emphasis: Occupational Education in the Two-Year College, Conference sponsored by the Midwest Technical Education Center and the American Association of Junior Colleges, St. Louis, Missouri, May 12-14, 1966, p 1.

In the meantime, as the businesses and industries in our highly technologically oriented society continue to advance, the "recruiters" of the big corporations have become more aggressive in their pursuit of the graduates of our universities. The "know-how" represented by those with Bachelor's, Master's, and Ph,D's is the life-blood of these companies. Management realizes that without a steady input of such talent a company would die. From the standpoint of the new college graduates (professionals), all have one common characteristic. They desire jobs that are interesting and challenging. They want to be able to work at the "upper end" of their "knowledge band" and not be burdened with the routine and mundane aspects of the job. This requires support help - the technician or semi-professional. But you say, "Who wants to do routine and mundane work?" The answer, of course, is no one. But, we have to remember the type of person who made the original statement; he is a professional. It could have been an electrical engineer with a master's degree which is a very important detail, because what's routine and mundane to such a person would probably be out of the realm of comprehension to the ordinary citizen. Hence, there is need for a specially trained person to work with the engineer - one who has a background in mathematics, physics, electronics; in addition to knowing his way around a laboratory.

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[2] Gleazer, Edmund J. Jr., "This is the Community College", Boston: Houghton Mifflin Company, 1968, p 54.

The conclusion is obvious. As the universities graduate more and more professionals, the need for sophisticated support help in the new technologies is increasing at even a higher rate. From a business and industrial standpoint this includes the whole range of special skills and knowledge of less than baccalaureate level that is essential in providing the goods and services Americans have come to accept as necessities. This brings us to our problem - the nation's need for more and better qualified industrial teachers to help train the technicians and skilled tradesmen required.

The Problem

Dr. John L. Feirer, Head, Industrial Education, Western Michigan University, states that the number one problem facing technical, vocational and industrial arts today is a teacher shortage.

> "Specifically, there is need for a tremendous increase in the supply of new, well-trained teachers. The problem is critical: if an answer isn't found soon, there will be no teachers for many of the students who need training to enter the world of work."[3]

A comparatively recent development in education is of special significance in regard to growing shortages of industrial teachers. Drs. Feirer and Lindbeck report that:

> "The community-junior college has grown since World War II beyond all expectations; today it ranks as the fastest growing branch of higher education. By 1965, there were over 475 public community-junior colleges in

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[3] Feirer, John L., "What is the Number One Problem in Technical, Vocational, and Industrial Arts Today?", a publication of the Industrial Education Department of Western Michigan University, p 1.

operation. Today, new ones are starting at the rate of 40 to 50 per year. Phenominal developments have been made in recent years particularly in states such as California, Florida, Illinois, Michigan, New York, and Texas. It has been conservatively estimated that over 700 public community-junior colleges will be in existance by 1970, enrolling over one and one-half million students.[4]

"While many community-junior colleges have developed pre-teacher education programs of a general nature, there has been little or no attention given to developing pre-teacher programs for specialized areas, particularly those in technical, vocational, and industrial arts education. A preliminary survey of 12 community-junior colleges in Michigan indicates that only two have any kind of pre-industrial teacher education program. The result has been that while the demand for industrial, vocational, and technical teachers has increased substantially, the four-year colleges and universities do not reflect a comparable increase in the number of qualified students enrolled in teacher education programs in industrial education. As a matter of fact, it appears that the development of the community-junior college has had a negative effect on the growth of enrollments in industrial education teacher preparation."[5]

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[4] Feirer, John . and John R. Lindbeck, "A Pre-Teacher Industrial Education Development Proposal for Community-Junior Colleges". A USOE sponsored project, Project No. 7-0074, Western Michigan University, p 1.

[5] ibid., p 2.

Proposed Program

The basic plan of the Feirer-Lindbeck USOE sponsored project to overcome the industrial teacher shortage:

> "......is to utilize the facilities, staff, and counseling services of the community-junior college in an articulated program of industrial teacher preparation in cooperation with four-year colleges and universities. Evidence today indicates that there is no organized program of industrial education preteaching at the community-junior college level and that this is needed if there is to be a reversal of the present slowing trend in the growth of enrollments in four-year colleges and universities in industrial teacher preparation. .....This program must be so articulated that community-junior college students interested in industrial teacher preparation can complete a bachelor's degree in four years without an appreciable loss of time, credit, or quality of preparation."[6]

One of the major objectives of the project is to write a set of guide lines to be utilized by both the personnel of the four-year institutions and the community-junior college to facilitate this articulation.

The Community College - Factors of Relevance to Increasing The Supply of Industrial Teachers

The term, junior college, may mean many different things to different people. Dr. Gleazer in his book entitled, "This is the Community College", wrote:

> "Questions are often asked about the diffrences between a community college and a

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[6] ibid., pp 3-4.

> junior college. 'Junior college', the older term, describes an institution which offers the first two years of college. ....."For the most part, the community college has become a comprehensive institution with a great variety of programs to match the cross section of the community represented in its students."[7]
>
> "How good is the community college? That question, to be answered needs a sharper point. ...."Goodness" -- or the utility of something -- can be judged only in terms of the job the thing is supposed to do. ...."So the question, to make sense, has to be rephrased: How good is the community college for the job it is designed to do? And that leads to the heart of the matter: What is the job?"[8]

Dr. Gleazer's answer to this question will have special relevance to the problem of helping to increase the supply of industrial teachers:

1. "All Available Talent"

> "The major assignment of the community college is to extend educational opportunity. It does this as an important part of society's need to broaden educational opportunity."[9]

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[7] Gleazer, op. cit., pp 27-28.

[8] ibid., p 46.

[9] ibid., p 46.

2. Accessibility

"......it brings the college opportunity to the 'doorstep' of the student. Ask almost anyone attending a community college why he is there and he will be likely to say: 'Because it's close to home.'"[10]

3. Cost to the Student

"One of the major tasks of the community college is to reach those who could not pay the cost of going to other institutions. The student minimizes his expenses by living at home. Tuition fees are low or non-existant. .....

.....a number of careful studies show that often the socio-economic background of the community college student is different from that of his counterpart in another college or a university. Relatively far fewer families represented are in the professional and managerial groups. Many more are in blue-collar occupations and live in low-status neighborhoods."[11]

4. Admission Policy

"The community college offers a broad array of services. Under an 'open-door' admissions policy, various educational programs are available to people of different aptitudes, interests, achievements, and ages. Professional counseling assists the student in selecting the lines of educational development most suitable for him.

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[10] ibid., p 48.

[11] ibid., pp 49-50.

> "Although publicly supported community colleges are predominantly open-door institutions, admission to programs within the college is on a selective basis.[12] ..... Placement tests are given to assist the counselor and the students in determining the student's potential. These tests do not influence a student's admission. All students attending college for the first time are admitted in good standing."[13]

5. "Second Chance Colleges"

> "Some students go to community colleges after they have attended other colleges where, for various reasons, they have not been able to realize their full potential. At the community college, they are close to home within their own community and very often can find themselves and get back on the track of achievement."[14]

6. Variety of Programs

> ".....the educational role of the community college is much broader than that of preparing the student for the upper division of a four-year institution. This is not, in fact, its chief assignment. Its major task is to provide those learning experiences commonly needed as a level of educational effort in each community rises two years beyond the high school."[15]

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[12] ibid., p 50.

[13] Junior College District of St. Louis County, "1968-69 Fact Book," St. Louis: Junior College District, 1968, p 7.

[14] ibid., p 18.

[15] Gleazer, op. cit. p 52.

Programs include:

> "College and University Parallel - Offers freshman and sophomore courses that will transfer to four-year colleges and universities.
>
> "Career - Provides occupationally-related curricula in the areas of engineering and industrial technologies, business, health and public service. Since this is a rapidly changing field of education, new curricula are added as the needs of the community indicate.
>
> "The General Curriculum - Designed for those students with uncertain objectives and limited previous achievements. The curriculum offers one year of general education, combined with individualized learning experiences designed to improve basic skills. Students who succeed in this curriculum will be encouraged to enter college and university parallel or career curricula at the end of one or two semesters. Other students will be counseled into educational curricula of a different nature, or will be given every possible assistance to find suitable employment.....
>
> "It emphasizes basic skills in reading, oral and written communication, mathematics, science, social science and health. Concentrated academic and vocational counseling, both group and individual, are available to students in this curriculum, and courses are designed to excite, stimulate and motivate the students.....
>
> "Developmental - Offered for those who need work of a remedial nature. Students correcting academic deficiencies

through such courses will be encouraged to continue their studies in other college curricula.

"Adult Education and Community Service - Affords the opportunity to discover that learning is a never-ending process. Men and women are encouraged to continue their quest for knowledge, enrich their lives, advance their careers and acquire new ideas through community service offerings."[16]

"About one-third of the entering students transfer on to four-year colleges or universities. One-third will complete technical education pre-employment programs. One-third will withdraw from college for various reasons, but of this number, many will re-enroll at a later date and complete an educational objective, perhaps of a different type."[17]

7. Occupational Education

"Today there is a vast array of occupations for which at least two years of college study are necessary. Often referred to as 'middle manpower' jobs, semiprofessional and technical positions comprise a major category of employment in business, industry, and the professions. They are an outgrowth of the technological revolution, in which automation has combined with mechanization to replace the unskilled and even the skilled worker in many instances in factories, in offices, on farms, and in hospitals and laboratories.....

"In addition to two-year occupational programs, the community college also ordinarily

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[16] Junior College District of St. Louis & St. Louis County, op. cit. pp 15-18.

[17] ibid, p 13.

> offers programs with shorter time requirement -- for example, preparation of licensed vocational nurses."[18]
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> "Anyone originally entering a career curriculum may, of course, transfer to a college parallel curriculum at any later date, if he so desires. In general, however, technical education (career) courses do not transfer to a four-year college and, therefore, do not apply to a transfer curriculum."[19]

8. College Parallel

> "A perennial problem for the community college in organizing courses that will carry transfer credit is the great affection each four-year college has for the presumed uniqueness of the content, sequence, and titles of its courses. Obviously, no community college could duplicate the programs offered by the hundreds of institutions to which its graduates might transfer. There would be little vitality in community college curriculums, moreover, if subject matter, textbooks, and course organization were prescribed by the senior colleges. The aim, therefore, is toward course equivalence. In a number of states the four-year institutions have agreed to give full credit for courses successfully completed which, though not identical, are equivalent to those offered in their own lower divisions.....
>
> ".....Knoell and Medsker, in their important study of the transfer student, recommend that weak students with both subject matter and scholarship deficiencies remain in the community college for more than two years before transfer in order to catch up with

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[18] Gleazer, op. cit., p 53.

[19] Junior College District of St. Louis and St. Louis County, op. cit., p 9.

their classmates who began junior college without deficiencies. They observe, too, that the student who stays in the junior college for his full two years tends to be more successful when he transfers.

"A large percentage of university and college graduates in states where the community college is well established now begin their work in community colleges. How well do they do? According to Knoell and Medsker, '....at least 75 per cent and probably as high as 80 per cent of the junior college transfer students achieved their degree objectives during a four-year period which began with their transfer to a four-year college or university in 1960.' .....judgments could not be made about the performance of the students independent of the context of the colleges in which they were enrolled and of the state systems of which they were a part. 'All or most junior college students could be successful in achieving their degree goals after transfer if they would select four-year institutions and major fields which are appropriate to their ability and prior achievement.'

"Obviously two-year and four-year colleges need to know each other better than has been true before. This begins with the understanding that the community college allows increasing numbers of high school graduates to begin work for the bachelor's degree who would not otherwise be able to do so for reasons of academic or economic deficiency, or for lack of family encouragement. Whatever institutional arrangements are devised for passage of the student from one institution to another, the aim must be to facilitate his progress, not to impede it. In an increasing number of states there exists both a spirit and organization through which this can be accomplished.[20]

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[20] Gleazer, op. cit., pp 54-56.

9. The Problem of Insufficient Educational Background

"....Various names are given to this function: remedial, repair, salvage, developmental. Often there is more than a hint of disparagement. But it is a legitimate -- even more, an essential -- task of the community college to deal with inadequacies in the student's educational background. .... The professionals of the community college will be qualified both in competence and in attitude to assist students who come with handicaps and who, in the language of a recent report, 'cannot progress in any type of collegiate training until they first achieve better mastery of tool subjects or the symbol systems: reading, composition, listening, speech, fundamental logic, arithmatic.'

"Community college leaders know that 'remediation' is an inescapable obligation in an institution which has an open-door admissions policy and which invites enrollment of all high school graduates and others who can benefit from its programs."[21]

10. Counseling

"Counseling about college attendance and career choice needs to be greatly improved at all levels--high school, junior college, and in the four-year institutions."[22]

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[21] ibid., p 58.

[22] Knoell, Dorothy M. and Leland L. Medsker, "From Junior to Senior College: A National Study of the Transfer Student," Washington: American Council on Education, 1956, pp 96, 97.

Issues or Problems

Feirer and Lindbeck[23] made a number of generalizations relevant to the establishment of a pre-industrial teacher curriculum for community colleges from which certain conclusions or implications were derived and the following issues[24] developed for use in a work-study conference on the problem.

1. Should there be uniform numbering and course descriptions?

2. How much of the general education, technical preparation, and professional preparation should be done at the community-junior college and the senior institution?

3. How can the quality of technical offerings be evaluated?

4. What steps can be taken to avoid loss of credits by community-junior college and transfer students into Industrial Teacher Preparation?

5. Can a cooperative program of Industrial Teacher Preparation (community-junior college and senior institution) be completed in four years? Should four and one-half or five years be the norm?

6. What kind of internship program can be developed to better prepare teachers?

7. How can the community-junior college be used as a laboratory for preparing Industrial-Technical teachers?

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[23] Feirer and Lindbeck, op. cit., pp 4-7.

[24] Tentative Program for a Work-Study Conference on: "A Pre-Industrial Teacher Curriculum for Community-Junior Colleges," Conducted by the Industrial Education Department, Western Michigan University, Kalamazoo, Michigan, March 1969, p 3.

Background information on these issues was made available to the work-study conferees. It included reviews of professional literature as well as survey findings of Feirer and Lindbeck.[25] The balance of this paper is devoted to the author's position on some of the background information and his views as to the major problem with which this conference is confronted - namely, helping to increase the supply of industrial teachers.

Viewpoints

Issue 1 - Should there be uniform numbering and course descriptions?

There is no question that uniform numbering and course descriptions would simplify the articulation of community colleges and senior institutions. If it were accomplished, this phase of admissions office work would be a very simple routine. Whether it's practical or not is another matter.

Developing uniform numbering and course descriptions would be a tremendous undertaking for community colleges to say nothing of the problems of achieving a consensus among the senior institutions. Even if a consensus could be achieved, a more difficult problem would be presented when trying to reach the agreements necessary later on to incorporate needed changes in course descriptions. Innovations in curricula would be stifled by the morass of red tape that would be developed to protect the system.

However, let's assume the objections mentioned to uniform numbering and course descriptions could be overcome. We now find ourselves confronted with another problem - the relationship between course descriptions and what instructors actually teach. Therefore, to make our uniform numbers and descriptions meaningful, some sort of monitoring system would be required. Even if these problems could be overcome, the time and expense required to implement such a program would be a major undertaking - both of which are limited commodities for most educators and educational institutions. The whole concept of standardization of courses and programs is fraught with danger because it implies that there is only one way; it tends to destroy initiative to experiment, to innovate, and to conduct much needed research.

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[25] Feirer, John L. and John R. Lindbeck, "A Pre-Industrial Teaching Curriculum for Community-Junior Colleges - Work-Study Conference Orientation Materials." A USOE sponsored project, Project No. 7-0074 Western Michigan University, March, 1969.

Issue 3 - How can the quality of technical offerings be evaluated?

Regarding this issue, the remarks[26] of Mayor John Lindsay of New York at the 1969 annual meeting of the Association of American Colleges seem apropos. He stated that, "Colleges and universities may be too inflexible and discipline-oriented to respond to the pressing problems of the day." He said institutions should seek to determine whether their ".....mammoth system of credits, requirements, prerequisites and standings discourage creativity, flexibility, initiative and risk taking."

In light of our objective to increase the supply of industrial teachers by improving the articulation between community colleges and the senior institutions, it would seem the issue should be restated. Instead of asking how to evaluate the quality level of technical courses, the question should be, "How can it be ascertained whether a course for a particular individual should transfer to the senior institution?"

This problem is not new. It has been present since earliest formal education systems. In higher education, it presents itself in several forms. One is the transfer of students among four-year colleges and curricula within colleges. Another is on the graduate level. However, the biggest source of variation in quality is at the freshman level. There are close to 25,000 secondary school systems from which colleges may draw their freshman classes. This number is in contrast to approximately 1,000 junior colleges. The problem, therefore, is not insurmountable and certainly not unique to community colleges.

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[26] Mayor John V. Lindsay, The Chronicle of Higher Education, January 27, 1969, p 1.

The Feirer and Lindbeck[27] survey showed that in 52.3% of the instances reported, the admissions office does all evaluation of both general education and technical courses that can be easily evaluated. The difficult cases are referred to the Industrial Education Department Head at the university. This would seem to be the logical approach. Certainly, actions should be taken to facilitate the work of the admissions office -- such as the preparation of course equivalency lists by individual colleges or groups of colleges.

Flexibility is the key in developing transfer policies to attract community college students into industrial-teacher preparation programs at the baccalaureate level. Basic criteria to consider include:

1. Education Objective

   If a student's educational objective is preparation for teaching junior-high school level general shop, for example, and he has an associate degree in electronic engineering technology of which nearly 30 of his 64 semester hours are related to electronics, the amount of credit transferred should be different than if he were preparing to teach electronics in a vocational school or community college.

2. Previous Success Record

   The Western Electric Company's salary schedule for college graduate recruits is based on the principle that the best predictor of success on the job is previous success in school. After years of experience, Western Electric found that more of their first quartile graduate employees were successful on the job than second quartile graduates, and so on. This implies that a more liberal transfer policy could be justified for certain community college graduates who perhaps for the first time in their educational careers demonstrated ability to excel in some area.

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[27] Feirer and Lindbeck, op. cit.

3. Interest in Teaching

   Interviews to determine the applicant's interest in teaching and working with students should be a primary consideration.

4. Personality for Teaching

   Interviews are needed to help determine how effective the applicant will be in relating to students.

5. Community College Curricula

   By definition there should be "few or no problems" with courses classified as "college and university parallel." Such courses are designed specifically for that purpose.

   "Occupational programs" represent a different situation. They are designed to prepare students for employment. Some persons refer to them as "terminal", the implication being that one cannot build on them to the baccalaureate level. Marvin Feldman of the Ford Foundation is diametrically opposed to this idea. In the joint JCD-SIU two-year post-high school occupational teacher project funded by the Ford Foundation one of the fundamental concepts is that graduates of associate degree occupational programs can build on their associate degrees to the baccalaureate level without the terrific loss of credits so frequently encountered. Feldman's goal is to make "occupational programs 'open ended' as a means of helping to relieve the stigma so frequently associated with them. We in industrial education at the university level have a great opportunity and responsibility to get our own house in order on this count.

6. Industrial, Military or Related Experience

> Related practical experience is highly desirable for industrial teachers and when feasible should be reviewed for credit consideration, especially in the cases of technical and vocational education teachers.

The assumption that all greduates of a given department should have exactly the same background is fallacious and impossible. A liberal transfer policy does not mean, however, that quality levels should or have to be sacrificed. Accrediting organizations recognize this in their work. They do not insist that all programs be the same to be accredited. Since the courses for a baccalaureate degree in a given field do not have to be exactly the same from institution to institution, should variation in the preparation of graduates at a given institution be a problem?

More flexibility in transfer policies is needed if the number andquality of industrial teachers is to be improved. Instead of limiting this discussion to articulation between community colleges and universities it should be broadened to include all two-year post-high school programs whether accredited or not. This would open many new avenues for helping to improve and increase the supply of industrial teachers. In fact, graduates of certain military educational programs should be considered too.

> Issue 4 - What steps can be taken to avoid loss of credits by community-junior college transfer students into industrial teacher preparation?

The loss of credit in transferring from a community college to a four-year institution can be avoided very simply, if the student has made several decisions early in his college career. They include knowing his educational goal, his discipline and the requirements for the baccalaureate at the institution where he plans to complete his work.

Industrial teacher trainers are presented with a problem because from the standpoint of goals most community college students are not oriented toward careers as industrial teachers. Students starting out in college-parallel programs are usually aiming toward degrees in engineering, business, or liberal arts with the idea of going into teaching, medicine, or law. The thought of preparing for a career in industrial teaching is foreign to them and usually passed over as an unattractive alternative. They know of the "dumping ground" concept some people hold for industrial education on the secondary level. Therefore, when these kinds of students first enroll in the community college they are "shooting high" and most of them would not even consider starting out in a pre-teacher program for industrial teachers.

The situation for students starting out in community college occupational programs is a bit different. Most of these students are not interested in completing a baccalaureate degree, but they do realize the need for additional education as a means of preparing for employment in our high technologically oriented phases of business and industry. Approaching such a student when he first comes to the community college about a baccalaureate degree in industrial education is unrealistic because, if the student thought he could or desired to complete the requirements for a baccalaureate, he would probably aspire for the same type of goals as those in the college transfer program.

Timing is the key factor in recruiting industrial teachers at community colleges. In the case of the college-parallel program student, somewhere between the end of the first semester of his freshman year and the end of his sophomore year he may discover that the subjects required for a degree in engineering, liberal arts, etc. may not be leading him where he wants to go--this is the time to recruit. Similarly, with the occupational student, he may find that his performance has exceeded his expectation and would now like to work toward a baccalaureate, only to his "horror" to discover the real meaning of the "terminal program" he is pursuing. However, through effective publicity he may discover programs such as those at Southern Illinois University where he could build on his associate degree to the baccalaureate level in industrial teaching or technology. This is the time to recruit for industrial teacher programs.

The timing problem results in a possible loss of credits. Ordinarily, the person in the college parallel program should be in good shape from the standpoint of transferring. Most of his courses have been in the liberal arts with little or no work in specialized areas. The occupational student's situation is different. Assuming he has an associate degree in electronics, nearly half of his background relates to electronics which, from the standpoint of the objective of the technician program, is mandatory to meet industrial requirements. From the standpoint of preparing such a person to teach industrial arts general shop, other competencies are required.

As long as there is a shortage of industrial teachers, the recommendation reported in the Feirer and Lindbeck Survey[27] by an Industrial Education Department Head that, "A very liberal articulation policy be adopted by industrial arts departments for lower division introductory course work" is highly desirable. At Southern Illinois University, for example, a graduate (with a good record) of a two-year technical program is admitted on a probationary basis and upon the completion of satisfactory work at S.I.U. credit can be granted for his associate degree level courses. Up to 71 quarter hours in a technical field can apply toward a bachelor's degree in addition to credit for college-parallel courses. As a result in the S.I.U. program, the loss of credits in transferring is minimized. Technical programs include not only those in accredited junior colleges, but also N.A.T.T.S. or E.C.P.D. accredited programs such as Sams Technical Institute and DeVry Technical Institute.

Admissions is a vital function in helping to increase the supply of industrial teachers and, since the supply and demand varies, requirements need to be flexible. It is true that competencies are important, but there are other factors that need to be given emphasis too - particularly for our nation's teachers. Ability and desire to communicate and relate effectively with students are essential characteristics for successful teaching but, unfortunately, they are too often lacking.

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[27] Feirer and Lindbeck, op. cit.

Issue 5 - Can a cooperative program of Industrial Teacher Preparation (community-junior college and senior institution) be completed in four years? Should four and one-half or five years be the norm?

The answer to the first question should be yes. This is the premise on which the college parallel program has been developed in community colleges. The first two years of a baccalaureate program (the lower division courses) can be completed in the community college after which the student would transfer to the senior institution for the upper division work and graduate studies. Since the great influx of students into baccalaureate programs in the last ten to fifteen years, community colleges are being developed in increasing numbers to meet the need of helping to prepare students who, in many cases, in previous years would not have had the opportunity for a college education.

A bachelor's degree program that requires a student to be on campus five years or even four and one-half years is not going to have much appeal. Most students would rather use the extra time in working toward a master's degree. The norm for a person completing the requirements for a bachelor's degree at the university should be two years beyond the time spent at the community college for the lower division work.

A "pre-industrial teacher" curriculum in a community college would be of value from an industrial education publicity point of view. However, from the community college standpoint there is little need for such a program because practically all have a "pre-teacher" curriculum. At the present time a "pre-industrial teacher" curriculum could not be much different from the programs already in the catalogs.

The major justification for a "pre-industrial teacher" curriculum will occur when the industrial education departments of the universities recognize that technical programs do not have to be "terminal" and set up a plan similar to the one in the School of Technology at Southern Illinois University. Once this occurs, "pre-industrial teacher" opportunities can be developed for industrial arts, vocational education, and technical education by selecting combinations of both "college parallel" programs and "occupational" programs.

> Issue 2 - How much of the general education, technical preparation, and professional preparation should be done at the community-junior college and the senior institution?

The following table is based on the Feirer and Lindbeck survey of Industrial Education Department Heads.[28] It shows the division of responsibility between community colleges and the senior institutions in the preparation of industrial teachers. In column "A" the "% Norms" that were given for the various types of industrial teacher preparation are shown.

Allocation of College Preparation
for Industrial Teacher Preparation
by Community College Students

Column "A" Preparation for Industrial Teachers		Column "B" Allocation Norms	
Types	"% Norms"	Senior Coll.	Comm. Coll.
General or Liberal Arts	35%	20%	50%
Technical	35%		
Prof. Courses in Ind. Ed.	10%	10%	
Ed. Courses including Stud. Teach.	20%	20%	
TOTAL	100%	50%	50%

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[28] Feirer, John L. and John R. Lindbeck, "A Study of a Pre-Industrial Teacher Curriculum for Community Colleges," Industrial Arts Department Head Survey, a USOE sponsored project, Project No. 7-0074, Western Michigan University, p 16.

Allocation of College Preparation for Industrial Teacher Preparation by Community College Students (Cont'd.)

Column "C"		Column "D"
Allocation "Actuals" by Comm. Coll. Programs		Recommended "% Norms" for Technical Teacher Prep.
Technical	College-Parallel	
20%	50%	30-40%
30%		35-50%
		5-10%
		15-20%
TOTAL 50%	50%	100%

Column "B" shows the author's "Allocation Norms" in the form of percentages for course work between the two institutions. These figures are based on the assumption that the upper division courses and professional courses in industrial education and education are the province of the university. In Column "C" the "actual" percentages for the types of course preparation are shown for both "technical" programs and "college parallel" programs. Comparing Column "C" with Column "A" one can see at a glance that transfer problems are almost inevitable. For example, in the typical community college pre-teacher college-parallel curriculum, the student would have approximately 50% General or Liberal Education, whereas, Column "A" shows the established maximum to be approximately 35%. In the case of the occupational student, about 30% of the total would be classes as technical and 20% as general or liberal arts. Furthermore, this work is "clouded" by the fact that it frequently is classified as "terminal" which automatically means problems in transferring.

It would seem that in order to have an attractive program from a transfer standpoint, there is going to have to be more flexibility. Instead of using "% Norms" shown in Column "A", percent ranges would be more appropriate with different course requirements and percentage ranges for industrial arts, vocational, and technical teacher preparation. For example, the industrial arts type courses would have to be taught at the university since by definition community colleges' industrial programs are technically and vocationally oriented. The author's recommended "% Norms" for technical teachers are shown in Column "D". As can be seen, from a community college viewpoint there is preference for increasing the general and technical education competencies of community college technical teachers at the expense of education courses.

> Issue 6 - What kind of internship program can be developed to better prepare teachers? and
>
> Issue 7 - How can the community-junior college be used as a laboratory for preparing Industrial-Technical teachers?

An effective internship program cannot be separated from a laboratory concept. It is essential for interns to be assigned to a "model school" where they would have access to the human and physical resources of the institution. This is the concept underlying the JCD-SIU cooperative internship program.

Interning should be in an educational institution of the type for which interns are preparing to teach. The reason for this is obvious. Furthermore, persons completing internships tend to prefer employment offers from institutions of the type in which they intern. This means that academic qualifications of interns need to be compatable with those required by the educational institutions in which they are preparing for employment, if favorable placement rates are to be achieved.

Increasingly, the academic qualification for teaching in community colleges is a master's degree in one's discipline, just as the doctorate is at the university level. In community colleges there are exceptions to this, notably in occupational areas such as dental hygiene and the hospitality industry; but the fact remains that the master's degree is becoming more commonly accepted as the normal academic qualification for teaching in a two-year institution of higher learning. University programs for preparing industrial teachers should ordinarily be at the master's level for college teaching and the bachelor's level for less than college level. This means that teaching internships for community college technical programs would be on the master's degree level. In those cases where a community college offers vocational industrial programs, an internship program could be on the bachelor's level. Internships for teachers of secondary school industrial arts should be in secondary schools as a part of their undergraduate program.

The emphasis placed on graduate degree qualifications for teaching in universities and the academic disciplines of community colleges is also important to community college technical programs. There are enough "image" problems confronting technical education without confirming it in the standards of preparation for teachers for community college technical programs. Furthermore, as technical education programs become more "open-ended", it would seem incongruous for the university programs to settle for teachers with bachelor's degrees at community colleges while at the same time stressing the importance of master's and doctor's degrees for teachers of freshman and sophomores attending the universities.

The one semester J.C.D.-S.I.U. internship program consists essentially of two parts. The first is teaching. Interns are assigned to a department at one of the three colleges in the Junior College District of St. Louis and St. Louis County to teach 40% of the normal full-time faculty load under the direction of a supervising teacher in his discipline. A supervising teacher is primarily concerned with advising his intern on the organization and presentation of subject matter as well as on the evaluation of the intern's students and the intern himself. Helping to establish contacts with other faculty members is another important contribution of the supervisor.

The second part of the internship program is concerned primarily with helping interns get the big picture of the comprehensive community college. The goal is to overcome some of the fragmentation that frequently exists in educational institutions among the various disciplines and place the emphasis on helping more students to become contributing members of society. The vehicle for doing this is seminars and other activities that involve the use of the J.C.D. as a laboratory.

Seminars are held twice a week for all interns. Since there are interns representing both academic and occupational specialties, a unique opportunity is provided for interaction and better understanding among the various disciplines. This helps to break the communication barrier and also the stigma that many persons in academic areas place upon occupational programs. Numerous resource persons from the J.C.D. provide interns with an unusual opportunity of discussing informally a wide assortment of topics and points of view relative to helping interns develop into more effective teachers.

Other activities are coordinated through the seminars and include the following:

1. Class Observations - These are intended to help achieve several objectives. One is to observe effective teaching techniques which the intern may wish to experiment with in his classes. Another is to help gain a better understanding of how his courses relate to others (both academic and occupational) as a means of reducing "overlaps" and "voids" in content. A third objective is related to better understanding the college transfer, occupational, developmental, and community service programs of the comprehensive community college.

2. Organizational Meetings - Interns are required to sit in on a number of types of organizational meetings, such as the President's Council, Instruction Committee, and Advisory Committees, for the purpose of helping them to better understand the organizational structure used to accomplish the educational goals of the institution.

3. Special Projects - These are customized to help the intern develop into a more effective teacher. The use of the J.C.D. as a laboratory is a key concept in this phase. All interns are assigned to investigate a learning problem of a student in one of their classes. They study the background of the student and then by working with the appropriate people in the J.C.D. try to help the student become more successful. All interns are required to have at least one video tape made of their teaching. They are also required to have their students evaluate their teaching. Besides these, a field assignment and two special projects of the interns' choice are required.

Although the interest and sponsorship for this means of helping to prepare teachers has been most encouraging, critiques of interns, their supervisors, and division chairmen are compiled for the purpose of helping to evaluate and, hopefully, improve the internship program.

There is another possibility for using community colleges as a laboratory in helping to prepare industrial teachers. Let's assume a student enrolled in a four-year college or university is not competent as a technician, but he wishes to prepare to teach in a technical program at a community college or technical institute. Let's assume also that at the particular university technician level courses are not taught, although programs are available in industrial arts and engineering. By definition and practice there is a difference between these options and the competencies needed by technicians. Therefore, in cases of this type a cooperative arrangement with a community college or technical institute with an outstanding technician program could be advantageous in helping students gain the needed competencies.

Conclusions

A continuing program to help ferret out the pertinent facts that have a bearing on the supply and demand of industrial teachers is essential. Among the types of information needed are the following:

Educational Considerations:

1. Current number of teaching positions open and projections of future needs by industrial teaching classifications and programs.
2. Total number of students being prepared as industrial teachers, by occupational specialties and levels.
3. Total educational capacity available for preparing industrial teachers, by occupational specialties and levels.
4. Total educational capacity available for preparing employees for business and industry, by occupational specialties and levels.
5. Salary ranges for beginning and experienced industrial teachers.
6. Job requirements and teaching loads.
7. Attrition rates for industrial teachers on the job, and why.
8. Attrition rates in the universities for students enrolled in industrial teacher programs, and why.
9. Open-endedness of job opportunities for experienced industrial teachers.
10. Information on the interrelationships of the various types of industrial education programs and the open-ended possibilities of each.

Business and Industrial Considerations:

1. Current manpower requirements by occupational specialties and projections for the future.
2. Salary ranges for beginning and experienced graduates of industrial programs.

3. Employment data on persons who have completed occupational programs - attrition rates, advancement, etc.

Assuming a program for preparing industrial teachers to be based on a liberal transfer policy along the lines previously described in the "issues", recruiting activities should include such things as:

1. Direct mailings to students in two-year post-high school occupational programs.

2. Direct mailings to students who have graduated from occupational programs and who have completed several years of related industrial experience.

3. Contact with persons leaving the military services who have occupational specialties.

4. Contact with persons in business and industry who have the desired competencies, but no previous teaching experience.

5. Exhibits and hand-out materials at community colleges and technical institutes.

6. Recruiting by university industrial teacher faculties at two-year post-high school level "college day" programs.

7. Films on industrial teacher preparation and careers.

8. Distribution of information to counselors and faculty of two-year post-high school level programs.

9. Field trips by potential candidates to the university for the purpose of meeting faculty and students regarding industrial teaching careers.

The need for increasing the supply of industrial teachers is undoubtedly of greatest concern and interest to industrial-teacher trainers. Therefore, if the supply is to be increased, the major impetus will have to come from the industrial-teacher trainers themselves. The job is too important to delegate to others who may not have the zeal to improve the situation. It is also too important to settle for a single-answer solution; innovation, experimentation, and research are needed.

Improved liaison with community college faculty, counselors and admissions office personnel would help. Course equivalency lists and other sorts of information should be of value also. However, the most important action to alleviate the teacher shortage problem is to improve communications with likely candidates. Such persons need to be made aware of the opportunities and requirements for teaching in industrial programs. Teachers too often overlook the fact that to many persons the most powerful recruiting appeal for teaching is the opportunity to help others.

Position Paper

Staff Requirements
For
Community College Technical Education Programs

Jerry S. Dobrovolny

Introduction

In the material supplied to the conferees, a statement appears in the proposal for this project that addresses itself most directly to the problem being discussed. The paragraph is identified as Generalization C and states the following:

> "The community-junior college programs do not have the same emphasis on the types of technical offerings as do the four-year industrial education programs. Generally speaking, community-junior colleges emphasize the areas of electricity-electronics, drafting, and mechanical technology including metalworking. On the other hand, the four-year industrial education programs, to date, have placed the greatest emphasis on woodworking, drafting, and crafts."

The changing manpower needs of our society have been extremely rapid during the last two decades. In many cases the program offerings at community colleges have been much better attuned to these needs than have the teacher preparatory programs at our teachers colleges. One of the important areas of understanding that is required as a basis of discussion is that of the semantics relating to technical education. The four terms most relevant to the discussion are industrial arts education, vocational education, technical education, and professional education.

Industrial Arts Education

Industrial arts education has been considered a part of general education and is referred to as being exploratory in nature. The industrial arts programs are normally offered in junior and senior high schools and are survey courses in such subject areas as metalshop, woodshop, printshop, home economics, drafting, electricity, and autoshop. Gordon O. Wilbur in his book on Industrial Arts in General Education defines industrial arts as:

> "Those phases of general education which deal with industry--its organization, materials, occupations, processes, and products--and with the problems resulting from the industrial and technological nature of society."

On the basis of this definition, a question must necessarily be asked with respect to the relevancy of the topics covered in industrial arts education. If it is to be truly a part of general education, then the leaders in industrial arts education must look closely at the processes and materials being used in the occupations in the modern industrial complex and relate them to the educational programs with which they are involved. Otherwise the curriculum, as it now stands in most places, is obsolete and is merely an exercise in arts and crafts which hardly justifies its inclusion as a part of general education.

Vocational Education

Vocational education is normally described as preparatory in nature to prepare a person for immediate employment on a specific job on the occupational ladder. It is a level of education that concentrates on the development of manipulative skills. Some of the typical vocational curriculums that are available are in such areas as trade and industrial education, distributive education, home economics education, vocational agriculture, business and secretarial training, and various others. The occupational titles of those completing the programs are normally the following: carpenter, stone mason, plumber, auto mechanic, appliance repairman, secretary, cook, bookkeeper, salesman, etc. The U.S. Office of Education's Cooperative Project for Standardization of Terminology in Instructional Programs in Local and State School Systems defines trades and industrial occupations as follows:

> "Trades and industrial occupations is the branch of vocational education which is

> concerned with preparing persons for initial employment, or for upgrading or retraining workers in a wide range of trades and industrial occupations. Such occupations are skilled or semiskilled and are concerned with layout designing, producing, processing, assembling, testing, maintaining, servicing, or repairing any product or commodity. Instruction is provided (1) in basic manipulative skills, safety judgment, and related occupational information in mathematics, drafting, and science required to perform successfully in the occupation, and (2) through a combination of shop or laboratory experiences simulating those found in industry and classroom learning. Included is instruction for apprentices in apprenticeable occupations or for journeymen already engaged in a trade or industrial occupation."

The significant thing to recognize when we are talking about vocational education is that there are many new fields that have developed in the last twenty years requiring a level of education at the vocational level to train persons for employment in the specific field. The health related occupational titles have had a significant number of job classifications requiring a vocational education as a preparatory laboratory and classroom experience prior to employment.

Technical Education

Technical education is perhaps the most misunderstood term in our taxonomy. It seems to mean all things to all people. The data compatibility group of the National Center for Educational Statics for the U. S. Office of Education has developed (1966) a definition of technical education to read as follows:

> "Technical education is concerned with that body of knowledge organized in a planned sequence of classroom and laboratory experiences, usually at the postsecondary level, to prepare pupils for a cluster of job opportunities in a specialized field of technology. The program of

> instruction normally includes the study of the underlying sciences and supporting mathematics inherent in a technology, as well as methods, skills, materials, and processes commonly used and services performed in the technology. A planned sequence of study and extensive knowledge in a field of specialization is required in technical education, including competency in the basic communication skills and related general education. Technical education prepares for the occupational area between the skilled craftsman and the professional person such as the doctor, the engineer, and the scientist.
>
> "The technical education curriculum must be so structured that it prepares the graduate to enter a job and be productive with a minimum of additional training after employment, provides a background of knowledge and skills which will enable him to advance with the developments in the technology, and enables him, with a reasonable amount of experience and additional education, to advance into positions of increased responsibility.
>
> "The technician frequently is employed in direct support of the professional employee. For example, the engineering technician will be capable of performing such duties as assisting in the following engineering functions: designing, developing, testing, modifying of products and processes, production planning, writing reports, and preparing estimates; analyzing and diagnosing technical problems that involve independent decisions; and solving a wide range of technical problems by applying his background in the technical specialties--science, mathematics, and communicative and citizenship skills."

The person completing a technical education program is called a technician. Most programs are two years in length and upon completion the graduate receives an associate degree in applied science or in a specific technology. In the case of the engineering related technology, the American Society for Engineering Education in its publication Characteristics of Excellence in Engineering Technology Education (1962) defines an engineering technician as follows:

> "One whose education and experience qualify him to work in the field of engineering technology. He differs from a craftsman in his knowledge of scientific and engineering theory and methods, and from an engineer in his more specialized background and his use of technical skills in support of engineering activities."

The technician works very closely in support of the professional person. He assists in developing the project that the team is working on and will become involved with calculations, prototype development, liaison work with the craftsman, and a wide range of support activities. Similar identifications of technician activities can be developed for the other professional fields, such as health, business, agriculture, architecture, etc. The content of a technical curriculum is cognitive in nature dealing with the more applicatory aspects of the particular science relevant to the technology being studied. The emphasis of using the laboratory experience as a vehicle for discovery is a significant characteristic of a technical education program. It is college level from the standpoint of the rigor and applicatory from the standpoint of the method of presentation of the subject matter in respective topical areas. This includes the basic sciences, as well as the mathematics.

Professional Education

Professional education is designed to prepare a person to enter the occupational ladder at a level that will require the capability of decision making with respect to the solutions of the problems facing society. Some of the recognized professional identifications are the engineer, the lawyer, the doctor, the economist, the accountant, the agricultural scientist, the physicist, the chemist, etc. The normal preparatory program requires at least four years of basic training, acquiring a bachelor's degree, followed by additional professional training and education such as law school, medical school, and advanced degrees in engineering, the biological and physical sciences. As an example, the professional engineer is identified as follows:

> "A professional engineer is competent by virtue of his fundamental education and training to apply the scientific method and outlook to the analysis and solution of engineering problems. He is able to assume personal responsibility for the development and application of engineering science and knowledge, notably in research, designing, superintending, construction, manufacturing, managing, and in the education of the engineer. His work is predominantly intellectual and varied, and not of a routine mental or physical character. It requires the exercise of original thought and judgment and the ability to supervise the technical and administrative work of others."

One of the questions that must be asked when we are discussing staff for technical education or, as far as that is concerned, the teaching staff for any kind of an educational program, is whether or not teaching is a profession or whether we select professionals and make teachers out of them. Further discussion of this point will be undertaken later on in this paper.

Characteristics of a Technical Curriculum

When designing a curriculum, the behavioral objectives of the graduate of such a curriculum must be first stated in rather discrete form. In the case of identifying the characteristics of a technical education program, the behavioral objectives of the curriculum will be related to the job functions expected of the technician who completes such a program. In the U.S. Office of Education publication entitled, Criteria for Technician Education--A Suggested Guide, OE-80056 (1968), the document states that the technician must have the following special abilities:

> "1. Proficiency in the use of the disciplined and objective scientific method of inquiry

and observation and in the application of the basic principles, concepts, and laws of physics, chemistry, and/or the biological science pertinent to the individual's field of technology.

2. Facility with mathematics; ability to use algebra and usually trigonometry as tools in the development, definition, or quantification of scientific phenomena or principles according to the requirements of the technology. Some must have an understanding of, though not necessarily facility in using higher mathematics through analytical geometry, calculus, and differential equations. Some may not even need a knowledge of trigonometry; for example, associate degree nurses.

3. A thorough understanding and facility in use of the materials, processes, apparatus, procedures, equipment, methods, and techniques commonly used to perform the laboratory, field, or clinical work; and the capability to use them to provide the specialized services required in the technology.

4. An extensive knowledge of a field of specialization, with an understanding of the application of the underlying physical or biological sciences as they relate to the engineering, health, agricultural, or industrial processing or research activities that distinguish the technology of the field. The degree of competency and the depth of understanding should be sufficient to enable the individual to establish effective rapport with scientists, doctors, managers, researchers, or engineers, and customers, workmen, or patients, and to do detailed scientific or technical work as outlined in general procedures or instructions. It requires individual judgment, initiative, and resourcefulness in the use of techniques, procedures, handbook information, and recorded scientific data or clinical practice.

> 5. Communication skills that include the ability to record, analyze, interpret, and transmit facts and ideas orally, graphically, or in writing with complete objectivity; and to continuously locate and master new information pertinent to the technology. Technicians must be able to communicate easily with all persons involved in their work."

The American Society for Engineering Education in its publication, Characteristics of Excellence in Engineering Technology Education (1962), defines the duties of a technician in the engineering related technologies as follows:

> "An engineering technician is one whose education and experience qualify him to work in the field of engineering technology. He differs from a craftsman in his knowledge of scientific and engineering theory and methods and from an engineer in his more specialized background and in his use of technical skills in support of engineering activities."

With the above stated behavioral objectives, the curriculum to prepare such a technician has normally been identified as a two-year associate degree program offered in a technical institute, community-junior college, or area vocational-technical school. Recent developments in the establishment of new programs in technical education reinforce the hypothesis that most of the technical education in the future will occur in the community-junior college complex.

A technical education program is generally spelled out as a 72 semester-credit-hour program with approximately the following breakdown of major subject areas:

Mathematics	9 to 12 hours
Physical Science	6 to 9 hours
Auxiliary and Supporting Technical Courses	6 to 8 hours
Technical Specialty Courses	33 to 38 hours
General Education Courses	11 to 15 hours
Average of total program	68 to 72 hours

These courses are usually designed specifically to meet the educational objectives of the two-year post-high school program and are not the traditional baccalaureate freshman and sophomore courses of a science or engineering curriculum. The identifying characteristic of these courses is the intermingling of the theory and application of the principles being studied. The instructors that are required to teach in this type of a program must necessarily have the subject matter competency, pedagogic ability, and industrial experience to properly present the subject matter.

Qualifications of Technical Teachers

Down through the years various groups have addressed themselves to the problem of determining the desirable qualifications of teachers for various subject areas and for various levels of educational programs. The passage of the National Defense and Education Act of 1958 with the Title VIII provisions was responsible for the impetus for the establishment of technical education programs in the State of Illinois. As far back as 1959 the critical need for qualified instructor personnel was well identified as a prime factor in the successful program implementation of associate degree programs in engineering technology.

Various other groups became acutely aware of this problem at about the same time, and as a result, a conference was called by the Area Vocational Education Branch of the Division of Vocational Education of the U. S. Office of Education in November 1961 for the following purposes:

> "1. To consider technical, professional, and employment experience requirements essential for a successful teaching.
>
> 2. To determine professional technical teacher education course content.
>
> 3. To design a suggested technical teacher education program.
>
> 4. To recommend patterns and operating procedures for the preparation of technical teachers."

This was a four-day conference and the participants came from a wide geographic distribution, as well as a wide background of individual subject matter competence.

It became apparent early in the conference that some limits had to be placed on the discussions in terms of the types of educational programs to be staffed. The conferees agreed to confine their considerations to the competencies required for the teachers of the more advanced subjects in post-high school programs preparing highly skilled technicians which we interpreted to mean associate degree types of programs.

The conferees agreed rather quickly that there are three major categories of competencies required of teachers that would enter the field of post-high school technical education. These are: technical subject matter, technical employment experience, and pedagogic ability.

The conference report does such a fine job of identifying the technical subject matter competency requirements of a technical teacher that I think I will take the liberty of quoting from the report.

"A. Ability to use algebra and trigonometry as tools in the development of ideas that make use of scientific and engineering principles; an understanding of and facility with mathematics through analytical geometry, calculus, and differential equations according to the requirements of the technology.

B. Proficiency in the application of physical science principles, including the advanced concepts and laws of physics and chemistry that are pertinent to the individual's field of technology.

C. An understanding of the materials and processes commonly used in the technology.

D. An extensive knowledge of a field of specialization with an understanding of the engineering and scientific activities that distinguish the technology of the field.

E. Communication skills that include the ability to interpret, analyze, and transmit facts and ideas graphically, orally, and in writing.

F. The ability to interpret and apply principles of economics and industrial relations as applied to a technology."

Perhaps the most significant aspect of the above statements is the fact they were developed by teacher educators who, by and large, did not have a technical background themselves. Any teacher to be qualified to teach in the kind of curriculum outlined in the section preceding this must necessarily have a sufficient breadth and depth in the subject matter in which they will be teaching beyond the associate degree program. This normally requires a minimum of a baccalaureate degree in the subject matter specialty to be taught. For some reason or another in some circles there seems to be some type of a myth making the rounds that technical teachers do not require the mathematics or science background that has been identified as minimum requirements by those working in the field. I am certain that all of us would be shocked if our children in the third grade, as an example, would come home with the story that their teacher had no more than a third grade education. Therefore, the parallel is a direct one and we must have competent teachers in the various subject areas in which they will be teaching with depth in their subject matter specialty beyond the level of the curriculum in which they will be teaching.

One of the important aspects of industrial experience is that it be relevant and that it be recent and up-to-date. Technical teachers should be encouraged to take summer work experiences that relate to the technical specialty they are teaching, as well as to do consulting work during the academic year to maintain a viable dialogue with the industry in their community and in their subject matter specialty.

The manner in which the pedagogic capability of a technical teacher can be developed requires a broader discussion than merely suggesting a series of pre-service courses in pedagogy. This will be discussed in greater detail later on in the paper, however, suffice to say at this point that the pedagogic capability must be built on a base of subject matter competence and industrial experience.

The Recruitment and Preparation of Technical Teachers

The sources of teachers in technical education programs in our community-junior college system are widely diversified. They range from the highly qualified professional person, such as the doctor, nurse, engineer, to the persons who have drifted into the field who have received their training in other disciplines such as in industrial arts and industrial education. A significant number of former armed forces personnel have also been attracted to the technical education programs. In some cases technicians with associate degrees have been utilized effectively in technical education programs. It is clearly evident that there is no consistent pattern of staff recruitment and staff development. The question that arises and must be answered is: Would it be desirable to have a single pattern of identification of qualified technical teachers?

Evidence supports the premise that we should not have a single tract system. This often leads to preoccupation with the establishment of non-flexible certification standards that cannot be sufficiently viable to meet the changing needs of our manpower training capability.

The wide diversity of backgrounds of our technical teachers, as is indicated above, necessitates a close scrutiny of our present approaches for providing the necessary pedagogic training for our teachers. For the purposes of this discussion, the references will be made to the engineering related technology programs with the understanding that the same rationale can be applied when talking about technical teachers in the other professionally related fields such as health, agriculture, business, architecture, law, etc. Any pre-service or in-service program for technical teachers must be designed to take into consideration the background of the teacher and provide him with the necessary information to enable him to operate successfully in the classroom or laboratory.

The Graduate Engineer as a Technical Teacher

One of the best sources of teachers for engineering technology is the graduate engineer with industrial experience. As a matter of fact, the American Society for Engineering Education in its report entitled, Characteristics of Excellence in Engineering Technology, devotes a section of this report to faculty. One of the recommendations of the report is:

> "that approximately half of the faculty members teaching the technical specialty should be graduate engineers or the equivalent."

In the case of a graduate engineer who has had the necessary industrial experience and now is changing his occupational objectives by moving into the field of technical teaching, we must consider a two-pronged preservice educational program for him. This can be obtained either on a full-time basis in a summer school session prior to the time he assumes the responsibilities in the teaching environment or in a night school program prior to his assignment to a teaching responsibility. In all likelihood a typical program for this individual would be to take some professional courses in education dealing with the philosophy of technical education, occupational analysis, fundamentals of teaching techniques, and some essentials of curriculum and program planning. These should be specifically tailored courses designed to meet the needs of the subject matter teacher at the post-high school level.

Newly graduated engineers without industrial experience would probably not have a proper identification with and appreciation of technical education. If they were to be used as staff, they should be carefully supervised by a senior instructor and be urged to obtain appropriate industrial experience as soon as possible. He certainly would be capable of teaching the subject matter; however, care must be taken to insure the proper emphasis of the applicatory nature of a technical curriculum.

Teachers from Other Disciplines

A program to prepare teachers for technical education curriculums who have obtained their original training in some other discipline, such as industrial education, a pre-service educational program must be structured that will emphasize the subject matter competence of the teacher. A series of three or four summer institutes or an academic year institute in the subject matter are the most efficient ways of obtaining the necessary subject matter competence. One of the important facets of their retraining program will be to also do work in the area of the philosophy of technical education.

Experience with these kinds of teachers indicates that their initial set in vocational education results in a rather narrow perspective in terms of the application of the subject matter in a problem solving situation. Their previous experience results in an approach of a single replicating solution to problems rather than an approach that results in a number of alternate solutions, as is the case in the problem solving technique used in engineering.

Not all teachers with this kind of a background are capable of being retrained as technical teachers. They must have some initial background in the fundamental mathematics and physical sciences, such as chemistry and physics, to enable them to build onto this base additional competency in mathematics, engineering science, and the technical specialty. However, there are a significant number of these kinds of people available and if they are carefully selected and properly motivated they can develop into excellent technical teachers.

Related Math and Science Teachers

Many schools utilize their technical subject matter specialist to teach the related mathematics and science courses; however, experience indicates that as a rule the courses that are taught by these individuals become very narrowly interpreted and do not provide the necessary broad concept approach that is desirable for a foundation in the mathematics and sciences for the technician. It is desirable to have carefully selected individuals who are subject matter specialists in the mathematics and physical sciences who have an empathy and understanding of technical education. The courses that are taught in the technical curriculum in mathematics and the physical sciences must be made relevant to the subject matter specialty of the particular curriculum. Much greater emphasis must be made on problem solving and the relevance of the topics to actual situations as they occur in the subject matter specialty.

A pre-service or in-service program for these kinds of teachers with a major emphasis on the philosophy and methods of technical education will help provide the necessary articulation of these teachers with the technical subject matter teachers.

Two-Year Associate Degree Graduate Technicians as Teachers

An increasing number of leaders in technical education are suggesting that perhaps the most appropriate road to follow in the development of competent instructor personnel for technical education programs is to develop teacher education programs to accommodate the two-year associate degree graduate technician who has obtained three to four years of industrial experience and is interested in teaching. In some cases these types of individuals can be used as instructors in some of the laboratory courses and the first year courses in a particular technology. However, for those who expect to teach the more advanced courses in the technology, they will require an additional academic experience leading to a baccalaureate degree. At the present time there is no uniform agreement among those that are involved in teacher education programs to prepare technical teachers on the type or curriculum best suited to prepare technicians to be teachers.

An increasing number of institutions are investigating the feasibility of offering programs to prepare teachers of technical education. To my knowledge, there are four schools that are actually offering a Bachelor of Science in the Preparation of Teachers of Technical Education. All four programs are quite similar. There are minor variations due to the local political structure of each institution. However, basically they have the same requirements. The four schools that are referred to in this case are: Oklahoma State University, Purdue University, University of Illinois, and Stout State University. The program content is basically as follows:

Area of Study	Semester Hours
Basic Science Includes mathematics, chemistry, and physics	32
Engineering Science Includes drawing, descriptive geometry, statics, dynamics, and strength of materials	14
Technical Specialty Includes machine design, a.c. and d.c. circuits, etc.	38
Education Courses Includes educational psychology, practice teaching, supervised work experience	24
General Education Communications, psychology, social sciences, humanities	28
	136 hrs.

In all cases the programs are so organized that a student can begin in the program as a freshman and continue on through, or he can be a graduate of a two-year associate degree program in engineering technology and preferably have several years of industrial experience. It is the judgment of many that are working in this field that this kind of an individual, who was in the top of his class, and has had industrial experience with the motivation to teach in a two-year associate degree program, would be the best candidate for enrollment in these kinds of teacher preparation programs. It is anticipated as more experience is gained by those involved in this endeavor that the pattern will be such that more and more students will come into this program after they have completed an associate degree program in technology.

When organizing a four-year baccalaureate program for the preparation of teachers of technology designed for graduates of two-year associate degree programs in technology, care must be taken to protect the integrity of the two-year associate degree program. The "two-plus-two" concept must be used. The additional work at the upper division must build on the foundation of the subject matter specialty obtained by the technician during his first two years. To do this effectively, some new courses must be developed in the upper division to successfully articulate the knowledge obtained by the respective teacher in his lower division technology work. Additional depth of subject matter specialization along with additional work in the basic related science and mathematics are prime requisites for a successful baccalaureate program. A very important component of the upper division work in the preparation of a technical teacher on the "two-plus-two" concept requires the development of a set of professional education course work designed specifically to meet the needs of the technical teacher.

Dr. Maurice Roney at Oklahoma State University has suggested four courses in professional education, along with a program of practice teaching, that are desirable to qualify the candidates for teaching positions immediately upon graduation.

Course No. 1 -- 3 Credit Hours
Introduction to Technical Education

This course would deal primarily with the philosophy of technical education as it relates in the total spectrum of education. It would address itself to the historical development of technical education, including the study of some of the legislation and contemporary accrediting policies of ECPD and the regional accrediting bodies with respect to occupational education; an analysis of educational institutions and programs in the field of technical education; a discussion of the basic requirements for teachers in technical education programs with specific attention to the technical competence, industrial experience, and pedagogy.

Course No. 2 -- 3 Credit Hours
Instructional Planning and Teacher Practices

This course would address itself to the nature of the learning process and its relationship to the teaching process with discussions of the elements of lesson planning; methods of teaching; the breakdown of course content into instructional units; evaluation in education; and student achievement levels in various class environments.

Course No. 3 -- 2 Credit Hours
Analysis Techniques in Technical Education

This course would concern itself with determining the needs for educational services by studying techniques for making occupational surveys to determine training needs; analysis of industrial occupations; educational content analysis; the application of the occupational analysis to identify specific skills and knowledge requirements of a particular technical occupation; and the study of the development of training program materials by correlating classroom theory and laboratory experience in technical course work.

Course No. 4 -- 3 Credit Hours
Program Planning in Technical Education

This course would address itself to the essentials of long-range educational planning with regard to philosophy, objectives, programs, organizations, staffing facilities, and finances. The use of surveys and studies to justify the establishment of new programs or the modification of existing programs; the use of advisory services through industrial advisory committees as well as governmental agencies; techniques in curriculum planning along with a comparative study of laboratory facilities designed for technical education; the involvement of other segments of the educational structure in the area of student services in terms of recruitment and selection; the use of various media for the public relations aspects of technical education programs; program evaluation; and various legal aspects of conducting technical education programs under various funding provisions of state and federal legislation.

Course No. 5 -- Variable Credit Hours
Practice Teaching

The practice teaching requirement of the curriculum should provide an opportunity for the prospective teacher to actually have an experience in a technical education program in a community-junior college or technical institute. There are very few schools at the present time that offer this kind of an opportunity. Care must be taken to insure the practice teaching experience to take place in a technical subject matter area of the specific technical capability of the student teacher.

Implementation of Technical Teacher Preparatory Programs

The qualifications for competent instructors in our community-junior complex, as outlined above, require a new approach from the traditional kinds of programs that are available today in four-year teacher training institutions preparing industrial education personnel. The importance of subject matter capability relating to the specific technology involved suggests that the kinds of institutions that can best participate in the teacher training program are multi-faceted universities with professional schools cooperating and working closely together with the college of education. Existing teacher training institutions will have to organize new programs, establish new laboratory facilities and hire subject matter specialists in order to produce the kinds of teachers that are required. This is an extremely expensive undertaking and therefore it is questionable whether or not these kinds of institutions can produce the qualified teachers for technical education.

The most feasible undertaking for the teacher training institutions would be to incorporate a "two-plus-two" program building upon the subject matter competence obtained in the two-year associate degree program at the community-junior college. However, over and above this, there still continues to be a need for additional subject matter competence, as well as additional math and science courses.

Teacher Evaluation

Today the quality of education is uppermost on the minds of many segments of our society, including the students. Many of the campus revolutionaries point to the problem of good teaching. Therefore, it is extremely important that all new teachers have some kind of in-service training program where they meet at least once a week with the senior instructor in the specific subject matter, and discuss the pedagogic problems relating to the subject matter to be presented the following week in the particular area that the new instructor is teaching.

The use of micro-teaching techniques and portable video-tape equipment are extremely valuable adjuncts to a sound in-service training program. It is desirable to insist upon all new teachers to participate in a program whereby some of their early lectures are video taped and then discussed with appropriate staff, such as a consultant educational psychologist, along with the subject matter specialist lead teacher. This kind of a program has proved to be extremely successful where it has been used as a vehicle for improvement of teaching.

In addition to this it is desirable to conduct a student evaluation of all teachers at the end of the term. Some of the items the student rating form will include will be such items as presentation of course material; knowledge of course material; preparation of daily lessons; ability to explain difficult material; statement of objectives and purposes of the course; vocal delivery; use of blackboard; use of teaching aids; attitude toward the class, including students in classroom discussion; ability to stimulate interest in the course material; the character of quizzes on the examination; fairness in grading; homework assignments; attitude toward students; availability for office consultation with the students; and the overall effectiveness as an instructor. In addition to this there should be some open-ended questions for additional comments. Many schools have participated in this kind of an activity and have found the information so gathered to be very objective and helpful to the teaching program. Care must be taken in the administration of this evaluation program to maintain the integrity of the instruments used by the students as well as the confidence of the data for the protection of the instructor.

The use of the portable video-tape equipment in the classroom can also help in researching new techniques in the conducting of classroom presentations by the instructor. It is desirable for the more experienced instructor to be video taped occasionally as a matter of maintaining a scholarly approach to the teaching function.

There is a need for the organization and the conducting of summer conferences devoted to effective teaching. This can be organized in various geographic localities throughout the United States and, for the purposes of this discussion, could very easily be conducted in several places in each of the participating states. A number of conferences have been held by such organizations as the American Society for Engineering Education and the Physics Teachers in the State of New York. I am certain that others have been conducted but these are two that I am personally aware of. Much greater attention must be paid to this facet of continuing education of teachers in technical education in the various community-junior colleges in the respective states. These conferences should be of two kinds; one that would address itself to the overall considerations in effective teaching in any classroom, and the other should be devoted to specific subject matter areas such as electronics technology etc.

Conclusions

All of the data that has been collected in recent years indicates that there is a tremendous shortage of qualified instructors in the technical education programs in occupational education. The instructors must possess three fundamental capabilities: 1) subject matter competence, 2) industrial experience, and 3) pedagogic ability. It is incumbent upon the community of scholars involved in the preparation of teachers to address themselves to the problem of preparing qualified teachers. The teacher preparatory programs of the future must be viable and flexible to provide an opportunity for the recruitment of staff from a wide range of backgrounds.

The traditional teacher-training institutions for the preparation of industrial arts teachers must make a serious analysis of their program objectives, not only from the standpoint of preparing industrial arts teachers, but also from the standpoint of moving into other areas such as the preparation of technical teachers.

The certification requirements for technical teachers must be viable to encourage the recruitment of qualified subject matter specialists. Every opportunity should be made available to the subject matter specialist to enter the field of teaching by providing them with especially designed in-service and pre-service training programs in the professional pedagogy courses.

The existing corps of teachers must be continually urged by the administration to maintain their subject matter competence by continual upgrading and continuing education activities.

Position Paper

Counseling and Guidance Problems in the Community College

Bruce Kocher

> ...It would not be too much to say that on the success or failure of our guidance program hangs, in all probability, the success or failure of our system of public education.
>
> --James Bryant Conant

In order to understand guidance and counseling problems in the community college, we must first have some understanding of the community college.

Two words, "individual" and "opportunity," are most often used in describing comprehensive community colleges. Those of us at community colleges like to think of ourselves as being student-oriented, and of our colleges as being student-centered institutions of higher education. Even our faculty, as Garrison reports,[1] see themselves as student-centered rather than subject-matter centered.

Philosophical statements in community college catalogs reflect our commitment to a student-centered approach. We state eloquently our beliefs that each person is important, is unique, is endowed with dignity, has individual needs and abilities, has a contribution to make to society, and has the right to an opportunity to reach his highest individual potential. We tell the student in no uncertain terms that the community college is dedicating its full resources to providing him with an opportunity for individual growth and development.

The community college offers a wide range of programs and courses: college parallel and vocational-technical, credit and non-credit, remedial and developmental. We like to think of ourselves as the college where every student will achieve success commensurate with his interests and abilities.

To all of this the community college adds the concept of the "open-door" admissions policy. Simply stated this means that entry into the college is unrestricted. All are welcome. The doors are open to any person, young or old, who believes he can profit by what the college has to offer, and the community college attempts to offer what the people can profit by.

The "community college" label seems appropriate as these are people's colleges, designed to serve a given community, and reflecting, in the curriculums offered, the economic, industrial, and social life of the communities they serve. This is the community college.

In accepting this definition, the major problem of the community college counselor is obvious. He is faced with an unselected, heterogeneous student population often described as: diverse, exploring, uncommitted, undecided, over-aspiring, inadequately prepared, undiscovered, and undermotivated.[2] The counselor must deal with many students who enter without a well-defined idea of what they hope to achieve, and with little or no knowledge of their abilities to achieve the various objectives open to them.

Don't misunderstand me. I believe in the philosophy of the community college movement. I believe the words "individual" and "opportunity" best describe the community college. I believe we are student-centered. I believe in the "open-door" admissions policy and in our willingness to accept all comers regardless of their educational backgrounds and experiences. I believe in the community colleges' wide range of programs and courses, each designed and maintained at an appropriate level for its intended purpose.

I also believe that the "open-door" must be more than a "revolving door," that the unrestricted entry of students into the community college must not become simply a license to fail. If the "open-door" policy of admissions is to produce something more than an unselected, heterogeneous group of students who must determine for themselves what they want to get from college, we must recognize the importance of the student services program, and especially the counseling and guidance function of that program, at the community college.

This problem of recognition is another problem of the community college counselor. Consider the situation found in one community college:

> There are two people on the staff who have professional training in counseling and student personnel work. One has the title of Director of Student Affairs, the other is called a counselor. The Director of Student Affairs also serves as the Dean of Men, and from 3 P.M. on is the Head basketball coach. His other duty is manager of the Student Union. The other person, the counselor, has three sections of psychology to teach this term with a total of 110 students, in addition to his counseling duties. Very little testing is done by the counselor primarily because (1) he doesn't have time, (2) he has to administer and score all tests given himself, (3) he has no place in which students can take tests except at a table in his office ...[3]

While this may be an extreme example, it points up the recognition problem. It also points out two other problems frequently faced by community college counselors, a lack of time due to an unrealistic student-counselor ratio and a lack of adequate space. At least the counselor described had an office large enough to contain table.

The best statement that I'm aware of in regards to the importance of student personnel services in the community college has been made by Collins:

> The student personnel program should be the pivot, the hub, the core around which the whole enterprise moves. It provides the structure and creates the pervasive atmosphere which prompts the junior college to label itself as student centered.[4]

As a Dean of Students at a new community college, you would hardly expect me to disagree!

Within the total student personnel program, the counseling and guidance services must be where the action is. Knoell and Medsker have written that the counseling function might be regarded as equal in importance to instruction in the junior college. I believe it must be considered of equal importance. If not, we can rightfully be accused of conning those students we attract with our open door.

Another problem recognized by many community college counselors is that all is not well with the "state of the art." The Carnegie Report on junior college student personnel programs pointed out very clearly that basic student personnel functions are not being adequately performed in the majority of those community colleges studied. As Collins states in his popularized version of the Carnegie Report, students' evaluations do not glow with enthusiasm for community college student personnel programs. Some functions are rated highly, yet the overall student assessment makes some widely touted views of community college personnel programs sound like myths. Counseling and guidance practices are inadequate and clearly not one of the major attributes of far too many community colleges.

A clear definition of his role is another problem of the community college counselor, particularly at a new institution. He knows he's somewhere between the high school guidance office, where he probably gained most of his experience, and the university counseling center, where he probably took his graduate training, but where is that? He must structure and clarify his role to meet the particular needs of community college students, or even more particularly, the needs of the students in his community college.

In the Survey of Guidance and Counseling in the Michigan Community Colleges the community college counselor's major role is repeatedly perceived as his work with students (1) who are adjusting to college level work, (2) who are making vocational and educational plans, and (3) who are coping with new knowledge of self and environment.

The counselor's day-to-day activities are seen most frequently as (1) counseling with students who are having academic achievement problems (2) interpreting test results in a counseling interview, (3) counseling with students who are undecided about a vocation, (4) counseling with students who are undecided about a major and/or senior college, (5) helping students with plans to meet transfer requirements, and (6) counseling with students who see their problems as "personal."

While attempting this, the community college counselor must also face the problem of defining his place within his college community. Is he faculty or administration? Garrison in his study of junior college faculty presented the faculty viewpoint on counseling and guidance which with few exceptions was one of dissatisfaction with these services. The counselor often has the intra-institutional problem of poor communication, of trying to keep informed about the variety of programs offered at his community college, of curriculum changes, and of the requirements for specific courses.

Added finally to all of these problems, is the problem of defining the role of the community college in the total scheme of higher education. Clearly, this is not the counselor's responsibility alone. It is rather the responsibility of the entire college community. But the community college counselor must shoulder his portion, for he is often the first contact with the community college for the prospective student and his parents. He must work effectively with the high school counselors who consider the community college as the place for those who are not admissible to a four-year college and he must combat the lower status all too often assigned to the vocational-technical-occupational programs. Our society still places high prestige on a university degree. Parents still want their children to have the rewards of a professional curriculum and a professional career.

The community college counselor must help his community to understand the words of John Gardner:

> We must learn to honor excellence (indeed to demand it) in every socially accepted human activity, however humble the activity and to scorn shoddiness however exalted the activity. There may be excellent plumbers and incompetent plumbers, excellent philosophers and incompetent philosophers. An excellent plumber is infinitely more admirable than an incompetent philosopher. The society which scorns excellence in plumbing because

> plumbing is a humble activity and tolerates shoddiness in philosophy because it is an exalted activity will have neither good plumbing nor good philosophy. Neither its pipes nor its theories will hold water.[6]

The community college counselor must point out the value and respectability of all programs of study offered. In doing so he must often overcome his own liberal arts background, his university orientation, and his lack of vocational knowledge. He must also help students to face the reality of their particular situations and academic capabilities and must assist them in making realistic educational plans consistent with their abilities.

This is the community college counselor and some of his problems as he attempts to perform his role and function. How can he assist and be assisted, in solving what has been described as the "Number One Problem in Technical, Vocational, and Industrial Arts Today?"

I believe the community college counselor survey that has been summarized for you provides some answers.

First of all, let's dismiss the notion that counselors are anti-technical, vocational, and industrial arts education. Counselors may be poorly informed but they are not opposed. We must realize that people work better in those areas with which they are more familiar and therefore more comfortable.

While communications is a word that is overworked, this is really what is needed. The survey shows that counselors want to establish a rapport with Industrial Education departments. They indicate an interest in and a need for direct and continuing lines of communication in order to alleviate the problems of articulation and transfer.

The survey also indicates that some meetings are taking place between Industrial Education Departments and community college counseling staffs but we know that meetings alone are not enough. The counselor must be supplied with the kinds of guidance, transfer, and course equivalency information that he and his students feel they need.

The information that is needed by community college counselors as they work with prospective transfer students has been discussed in the Guidelines for Improving Articulation Between Junior and Senior Colleges statement by the Joint Committee on Junior and Senior Colleges. Among the issues presented in the statement are those dealing with course status, curriculum change, requirements for admission and upper division standing, student characteristics, performance of transfers, student services, academic advising, transfer student orientation, and student activities. These counselors need to know which of their courses are acceptable at the four-year college in satisfaction of specific requirements. Course status can best be determined through regular joint review of community college course offerings by appropriate persons. Agreements reached must be reported clearly to counselors and advisors at both institutions.

Community college counselors should be kept informed of proposed changes in curriculum by systematic reporting through newsletters, bulletins, and conferences. Students transferring directly from the community college should be allowed to meet graduation requirements as outlined in the catalog in effect at the time they entered the community college. Admissions requirements including the acceptance of transfer credits and grades, must be clearly understood by the counselor. This information can be easily provided by clear and comprehensive statements of transfer admission requirements by the four-year college.

To assist students in the selection of appropriate transfer institutions, counselors must be made aware of the significant differences between colleges. The preparation and distribution of student profiles by the senior college can be most effective in this regard.

Counselors also need to be well informed about the success and failure of former students who have transferred to the four-year college. Performance information on these transfers, such as grade reports, notification of honors earned, and the names of graduates should be regularly reported back to the community college in a usuable form.

Annual follow-up conferences should be held on the four-year college campus, giving community college counselors an opportunity to meet with their former students. This follow-up conference should not be a part of the usual Principal-Freshman conference but should be designed specifically for the community college transfer. Information gathered through such a conference would supplement the regularly reported data.

The scope and availability of student services at the four-year college should also be stressed. If student services are important at the community college, they are also important for the community college transfer student. All too often the conditions which determined the student's original enrollment at the community college become more acute after transfer as he is faced with a more complex and expensive environment.

The designation of a specific advisor within the Industrial Education department for the transfer student is of particular importance. This advisor should be someone who is willing to serve in this capacity; someone who accepts the community college's role in higher education; and someone who is knowledgeable about community college programs. Recognition must be given to the special needs of transfer students in orientation programs, and to the barriers encountered by community college transfer students who wish to participate in student activities. Many of these problems can be alleviated by the designation of a liaison person within the Industrial Education department. Such a person would be responsible for the articulation program between the department and the community colleges. Basically, he would develop those programs and procedures necessary to effect a smooth transition from the community college to the four-year college campus.

In summary, I have asked that you understand the community college concept. I've asked you to recognize the importance of the student services program, and especially the counseling and guidance function of that program, at the community college. I've asked that you recognize some of the problems faced by the community college counselor as he attempts to work effectively on his campus.

I've further asked you to recognize that the effectiveness of community college counselors is often impaired becuase they lack specific information.

I've reviewed for you some of the guidelines established for improving articulation between the community college and the four-year college or university.

I've recommended the establishment of clear and concise agreements regarding course equivalencies; the regular reporting of proposed curriculum changes, academic performance information; and student profiles; the development of concise admissions requirements; the establishment of annual follow-up conferences; and the designation of a liaison person within each Industrial Education department.

I would also recommend that you consider the effectiveness of meetings and conferences for the dissemination of necessary information. Community college counselors often think of themselves as overworked and material mailed does not always receive the attention it deserves. Face-to-face discussion enables you to point up the significance of the information provided and to suggests ways in which such information can be most effectively used on the community college campus.

I would further recommend that the importance of appropriate community college faculty not be overlooked and that such faculty be included in the articulation process.

Finally, and perhaps most important, I would recommend that the Industrial Education department develop a transfer student handbook. The information needed by the community college counselor and his students is available but usually in a variety of lengthy publications from several sources at the college or university. There are several references in the Community College Counselor Survey to the fact that condensed versions of bulletins and catalogs are desired by the counselor in order to be of most use.

A transfer student handbook could be designed for use by both the community college counselor and the prospective transfer student. I would suggest that it contain the following information:

1. A general statement regarding the importance of community college transfers to the four-year college, opportunities available to the transfer student, specific admission requirements, and general policies regarding transfer credits. Such a statement should set the tone for the college and make the community college transfer student feel welcome.

2. General information regarding the four-year college including accreditation, history, educational goals, control, academic organization, academic calendar, and opportunities for student invovlement in the college community.

3. Specific information regarding the Industrial Education Department, including the purposes of the department and its facilities. Specific information regarding the curricula offered by the Department in Industrial Arts teaching and vocational-technical education should be included. Placement opportunities following graduation and salary information should also be included in this section.

4. A listing of the basic or general education courses required of all students and the community college course equivalents generally accepted to meet these general education requirements. This section could be general in nature but designed in such a way as to enable the community college counselor to list specific equivalents for his institution.

5. A pre-professional curriculum guide for the industrial education programs. This section of the handbook could be designed to show typical programs.

6. Specific requirements for secondary and vocational certification as a teacher. Counselors and students seldom understand certification requirements.

7. Financial aid opportunities for transfer students. Increased costs are of major concern to many students transferring from the community college.

8. A schedule planning sheet that the counselor and student could use to determine his standing in regards to degree requirements.

9. An application for admission to the college or university.

A transfer student handbook of this nature could be tailored by the Industrial Education Department to project the image it desires. Such a handbook would provide the needed information in an abstracted form, would be relatively inexpensive, and easy to keep updated.

I believe the development of a transfer student handbook by the Industrial Education department would prove to be an effective articulation tool. Such a handbook would attract students to the Industrial Education programs and would be welcomed by the community college counselor. I recommend it for your consideration.

[1] Garrison, Roger, *Junior College Faculty: Issues and Problems*, Washington D.C.: American Association of Junior Colleges, 1967.

[2] *Final Report*, *Direction and Emphasis, A Survey of Guidance and Counseling Programs in Michigan Community Colleges*. Lansing, Michigan: State Board of Education, Department of Education, 1967.

[3] *Junior College Student Personnel Programs, Appraisal and Development.* A Report to Carnegie Corporation, November, 1965.

[4] Collins, Charles C. *Junior College Student Personnel Programs, What They Are and What They Should Be*. Washington, D.C.: American Association of Junior Colleges, 1967.

[5] Knoell, Dorothy M. and Medsker, Leland L. *From Junior to Senior College: A National Study of the Transfer Student*. Washington, D.C.: American Council on Education, 1965.

[6] Gardner, John W. "Quality in Higher Education" *Junior College Journal* 27: 522-26; May, 1958.

Position Paper

Admissions and Transfer Problems of the Community College Transfer Student

Cameron W. Lambe

The tidal wave of transfer students coming to the four-year institutions from community colleges is having a particularly strong impact on departments of industrial education. Altogether in the states around which this Conference is revolving, it is estimated that one-fourth of the students in the four-year colleges and universities are transferees from two-year institutions. In industrial education departments, however, this figure is reported by admission officers to be approximately 71%.[1] In other words, seven out of every ten students we now have in our industrial education departments in these six states have come to us from community colleges.

What do we know about community college transfer students? Knoell and Medsker, who completed a nation-wide study of these students in 1965, describe them as being mostly white, Protestant, of native-born parentage, ranking in the upper half of their high school class, and citing economic reasons for attending community colleges.[2]

On the questionnaires completed by students in preparation for this Conference, most indicated that, as high school students, they were in general or college preparatory curriculums. A majority took high school industrial arts courses for a variety of reasons but particularly because of an interest in industrial arts. They appear to be basically nonvocationally oriented individuals who took high school industrial arts courses and are now involved in technical-industrial teaching programs in four-year institutions.

Perhaps of almost equal significance as we discuss students are the types who are not entering the industrial arts teaching field. One type of student on whom we have had a very limited impact so far is the good student, who tends to enter academic programs. Unquestionably, the problem of interesting good students to teach industrial education is complicated both in high school and the community college by the relatively poor image of vocational-technical education. Consequently, the good students are siphoned off into other programs that appear more attractive to them, and the trade and industrial courses are left with students of generally lower academic ability.

Another type of student who rarely enters the field of industrial education is the member of a minority group. Very few teachers now in the field are nonwhite. This undoubtedly reflects, at least in part, the difficulties nonwhites have encountered in their attempts to enter trade unions. The result tends to be a vicious cycle in which minority students often fail to identify with their white industrial arts teachers. They aim toward other occupational fields, and the white teacher--white student--white trade union member--white teacher cycle continues unbroken.

One problem often faced by the community college student who does have an interest in industrial education is that his community college does not have a pre-industrial education curriculum. As a result, he has to select an alternative program in the community college, usually one of the technologies, from which he hopes to transfer to a four-year college industrial education curriculum at the end of two years. Most courses in the community colleges seem to be structured for vocational-technical training rather than designed to prepare students to teach in the industrial arts fields where the breadth of exposure is more valuable than depth in one major field at the lower division level.

Financial problems are common to many community college students. For the most part, the students come from less well educated families with lower incomes than the families of those who enter four-year institutions as freshmen. In a Michigan study involving students in industrial-technical curriculums, Larson found that three-fourths of them worked on full or part-time jobs while attending the community colleges.[3]

As the community college student considers transfer to a four-year institution, he faces annual costs that in two-thirds of the institutions exceed $2,000.[4] He is often uninformed about scholarship, loan, and other financial aid arrangements that may be available to him. At the same time, he may be discriminated against by regulations that require a semester or year in residence before he can become eligible for financial assistance. He may find, too, that the policies of the four-year institutions even discriminate against helping new students locate jobs. Students planning to transfer at mid-year often discover that financial aid funds are already committed for the entire academic year and that none is available to students entering in the second semester.

Selection of an appropriate four-year institution is another major problem the community college student faces. In their study, Knoell and Medsker, concluded that most transfer students could be successful if they would select institutions and majors which are appropriate to their abilities and prior achievement.[5] For industrial education students, the choice of schools is more limited because they must find one that not only prepares teachers but that offers work in their area of specialization. The problem is heightened by the fact that college catalogs tend to be vague, and it is often nearly impossible to obtain factual information from them. Only too often, course equivalent sheets are not available from the four-year institution to help the student and his community college adviser to make a decision.

The student's adviser himself typically knows less about industrial education programs than he does about most other transfer programs, so he is often of limited assistance to the student. He tends to be of even less assistance if he is advising, as he sometimes is, outside his field of competency or if the institutions the student is considering are out of state.

Once the student has selected the four-year college he desires to attend, he may discover that an admission quota system is in effect and that no openings remain for the next school year. No admission preference is normally given to community college transfer applicants over freshmen applicants. If the freshman applicant cannot gain admission to a four-year college, he usually has the alternative of attending a community college. If the transfer student cannot gain admission to a four-year institution, he has no such alternative.

If the transfer student does gain admission, he often encounters further difficulties. With the tremendous growth in the number and size of community colleges, each unique in its curricular offerings and methods of instruction, and the transfer of students from these two-year colleges to senior institutions that also have widely differing characteristics, requirements, programs, and teaching methods, serious articulation problems almost inevitably result. The problems are accentuated, however, by the fact that often there is no single person on the two- or four-year college campus designated as an overall coordinator of relations with colleges at the opposite level. Community colleges complain that senior institutions dictate courses and programs the two-year colleges should offer. Not content with that, so say the community colleges, the senior institutions then make changes in their own programs and courses without notifying their junior partners in advance. Consequently, the student is caught in the middle as he transfers from one institution to the other and suddenly learns to his consternation that the program he has completed does not flow smoothly into the industrial education program at the four-year college.

Many students lose credits when they transfer. In evaluating transfer credit, a common practice is for the admission officer to make a decision as to the acceptability of general education courses and let the industrial education department head decide on the value of courses in the student's major field. Unfortunately, the evaluation is often delayed until after transfer, so the student is left "up in the air" for some period of time until he finally learns what credit he is to be given. Many senior colleges will accept from the two-year colleges no more than half the total number of credits required for graduation. The student loses any credits in excess of this figure. Furthermore, he may discover that some courses required by the community college for an associate degree are not counted by the four-year institution. Any courses in which he earned a grade of "D" are usually deducted, as are community college courses taken for remedial purposes to satisfy high school deficiencies.

Most senior institutions do not count community college grades in computing grade point averages after transfer. Many transfer students complain about having to build a new grade point average after transfer. The transfer student who drops below a "C" average in his first semester at the senior college is usually placed on academic probation regardless of how high his community college grade point average might have been. If his second semester's grades no not improve appreciably, he will likely be dismissed.

Another troublesome problem concerns general studies requirements. An industrial education student who completes an associate degree at a community college satisfies general studies requirements at the two-year institution. Upon transfer to the four-year college, he is then usually checked to see if he has satisfied the specific general studies course requirements of the four-year college on a course-by-course basis. As a result, he may be required to take additional general studies courses.

Many senior institutions will not allow transfer credit for courses taken in so-called "terminal" programs. Frequently, graduates of these programs, after working for awhile, decide to continue their education and then are shocked to find that little, if any, credit will be granted for the courses they have completed.

Many community college transfer students have reported feeling "lost" upon their arrival on the four-year college campuses. With some notable exceptions, the senior college campuses are usually much larger than their two-year college counterparts, and this fact does little to help the transfer student feel at home in his new surroundings. Typical orientation programs for new students planned by the four-year colleges are aimed largely toward freshmen and occur in the summertime when the transfer students are usually employed. It is little wonder that the community college transfer students often feel that they are unwanted intruders.

So far, we have concentrated on presenting articulation problems largely from the viewpoint of the community colleges and students who transfer from them to four-year colleges. Now let us take a look at the articulation picture from the senior colleges' point of view.

First of all, the four-year colleges often complain that, because of the great diversity among the two-year institutions, it is difficult for admission officers and industrial education department heads to know exactly what has been included in courses completed by entering transfer students at many different two-year colleges. They also complain that it is difficult to evaluate the quality of such course work. They point out that methods of teaching and grading philosophies and procedures vary markedly among the junior institutions and that a grade of "C" in some two-year colleges, for example, may be given for compliance with course requirements at only a minimally acceptable level. In other cases, transfer students arrive on the four-year college campuses without having made up all deficiencies, and, consequently, are not ready to embark upon a full-fledged industrial education program. Particularly in the case of students transferring from technical colleges, a common complaint expressed by the senior colleges is that the students come with too great a concentration of credit in one technical area and little in the arts and science areas.

Special problems are posed by students who transfer before completing full programs at the two-year colleges. The fragmented course completion patterns of these students are often difficult to piece together into meaningful wholes. They usually do not fit into whatever articulation agreement may exist between the two-year and four-year colleges involved. In the Knoell and Medsker study, it was found that students who transfer before two years have higher attrition rates and lower grades than those who complete a full program before transfer. This is usually true even of students who were above-average achievers before transfer.

Many studies have been undertaken to determine how well community college students achieve academically after transfer to four-year institutions. The Knoell-Medsker study is the most ambitious and far-reaching study that has been done on this subject. Several years ago here at Western Michigan University, the writer completed a study of the success of community college transfer students on this campus.[6] Recently, Dr. Jack Asher, Director of our Office of Institutional Research, completed a further study of transfer students at Western,[7] and Charles Ferguson, one of our faculty members, conducted a study dealing specifically with industrial education transfer students. Both studies indicated no major changes in the picture since the earlier study. Now what has been learned from these various studies? For one thing, we have learned that students will usually earn lower grades in their first semester in the senior college than they did before transfer. In the second and succeeding semesters, the students tend to recover and generally earn grades that are not significantly different from those earned by native students. This is particularly true of those who transfer to senior colleges and universities such as Western that are primarily involved in educating future teachers. Those who enter large state universities, such as the University of Michigan, that are not primarily engaged in teacher training, tend to do less well than the native students, to be less likely to graduate, and to take longer than native students to earn degrees. The transfer often has trouble with physical sciences, particularly if he enters a large state university. In the Knoell-Medsker study it was found that those students who, by the end of their freshman year, had selected the particular four-year college they would later attend had significantly less difficulty after transfer. Overall there was found to be a wide variation in the chances for success among the states, the types of institutions, and the individual institutions themselves.[8] Perhaps the most significant point of the various research findings is that the community college students do amazingly well on the senior college campuses when we consider the general lack of effective articulation between institutions and the many road-blocks thrown into the path of the transfer students.

For the most part, transfer students are still required to have only a "C" average earned on the community college campus in order to be eligible for admission to the senior college. The University of California, however, requires students not eligible for admission as freshmen to present a "C+" average and to earn 56 units at a community college before transfer.[9] The University of Michigan has a selective admission policy for community college grades, as well as other individual characteristics. Many four-year institutions have been raising their admission requirements for freshmen but not for transfer students, which means that students coming from community colleges may find themselves in increasingly stiffer competition with native students of higher academic ability as well as two years' experience with the "system."

Some four-year colleges now follow the practice of disseminating to the community colleges grade point average and other information regarding transfer students on their campuses. The two-year colleges that do not receive this type of information are without important feedback. They are, therefore, handicapped in their attempts to evaluate and replan courses and programs and to advise students as to the senior institutions that appear to be most appropriate for them in light of their aptitude and achievement records.

The question of how far articulation can be voluntary and yet be effective and when it should become compulsory or a matter of state ruling after discussion is a major point for debate. In the concluding section of this paper, the writer will present a number of general and specific recommendations from the point of view that flexibility is vitally important to two-year and four-year institutions alike and that all possible avenues of voluntary articulation should be explored before imposing a system of compulsory articulation at the state level.

Recommendations

1. Wherever possible, community colleges should establish a pre-industrial education curriculum to meet the needs of students who would like to become industrial education teachers. The curriculum should stress a broad approach to the field rather than specialization in one major field.

2. Every community college student should have an adviser who is fully conversant with the student's chosen field. Students planning to become industrial education teachers should be assigned advisers who know the field of industrial education and who are acquainted with the curriculums in the four-year institutions to which the students are likely to transfer. The advisers should also have a general working knowledge of curriculums in out-of-state institutions. They should know the faculty members in the industrial education departments at four-year colleges and be in a position to give students meaningful information regarding senior college courses, methods of instruction, required levels of student competency, facilities, and degree requirements. Obviously, the best way for the advisers to obtain this information is to make periodic visits to the four-year college campuses. In addition, the advisers should have knowledge of the success or failure of former graduates of the community college who have attended the various senior institutions.

3. The student should be encouraged by his adviser to select an appropriate four-year college at least by the end of his first year at the community college so that his program of courses will be as well planned and articulated as possible with the curriculum at the senior college.

4. The student should be encouraged to remain at the community college until he removes all deficiencies and completes a full associate degree program before transfer, even if it necessitates his remaining at the community college an additional semester or year. This will enhance his chances of being successful after transfer to the senior institution.

5. Senior colleges on a regular basis should provide community colleges with as much meaningful information as possible concerning the progress of community college alumni on the four-year college campuses. They should also host community college conference days for the purpose of having representatives of the community colleges confer with their alumni on a person-to-person basis. During such "days," the industrial education department should take advantage of the opportunity to invite community college industrial education faculty members to be present for the conference and to visit the industrial education department facilities and meet their senior college counterparts.

6. The community college should carefully analyze the information received from the senior colleges and from their alumni with an eye to identifying possible problem areas and taking steps to remedy them.

7. At each two-year and four-year college, a person should be designated as the overall coordinator of relations with colleges at the opposite level. While such a step undoubtedly would not solve all articulation problems, it would be a major step forward from the present system in which, for example, several representatives of a four-year college communicate individually with a community college, sometimes furnishing conflicting information and each often unaware of what the others are doing or saying.

8. Senior college industrial education departments should spearhead a major recruiting drive aimed at high school juniors and seniors and community college freshmen. In attempting to present a more favorable image of industrial education to students, parents and others, possibilities include up-to-date, attractive brochures, 35mm. color-sound films, slides, and transparencies. The departments should investigate the recruitment programs followed by the Phoenix, Arizona,[10] and New York City industrial arts departments.[11] These programs stress the early identification of industrial education candidates and involve such ideas as speeches by teachers at parent-teacher association meetings; bright, informative literature; exhibits; television programs; and other devices designed to make students and the public aware of the field of industrial education. One major part

of such a drive should be directed toward the high school counselors, who should be encouraged to counsel good students toward the industrial education field. An excellent device every industrial education department should seriously consider is the brochure included by Dean Kocher of Kalamazoo Valley Community College in his presentation.

9. Industrial educators should make a serious attempt to recruit members of minority groups into their programs. This needs to be coupled with an opening of trade union membership to more nonwhite members, and industrial educators have a responsibility to do everything in their power to bring this about. If good nonwhite students can be attracted to the industrial education field, they, in turn, can later present an image to younger nonwhites that will also attract them to industrial education.

10. Industrial education faculty members from the four-year institutions should visit the community college campuses regularly and become well acquainted with the instructors, courses, methods of teaching, and facilities. With this knowledge, they should be in a better position to guide transfer students from the two-year colleges who are their advisees.

11. Each year the state of Washington issues to all counselors and admission officers an updated statement listing course equivalents for all two- and four-year colleges in the state, degree and major requirements, and transfer information.[12] If the preparation of such a comprehensive statement is not feasible in other states, the individual colleges should at least prepare their own course equivalency sheets for all community colleges in their service areas and keep such sheets up to date.

12. There must be full recognition of the fact that serious financial problems face community college students who desire to transfer to senior colleges. Every four-year college should carefully consider its financial aid program and insure that the needs of community college transfer students are being met as fully as possible. Student financial aid officers should visit the community college campuses, become familiar with the needs of the students, and inform both the students and their counselors of all financial aid arrangements that are available

and the specific procedures for making application. Recent federal legislation providing funds for financing the preparation of teachers in occupational areas should provide important assistance for students in industrial education. Departments should work closely with student financial aid officers at their institutions, however, to insure that needy transfer students are brought to their attention. The departments also can be of important assistance in helping such students to find part-time or summer employment, particularly in work directly related to their major fields. Work-study plans should be expanded wherever possible.

13. If it is necessary for a senior institution to establish an admissions quota, it should keep the cut-off as flexible as possible as far as community college transfer students are concerned. Even if a general closing of admissions is necessary, further admissions should be allowed to specific curriculums, such as industrial education, where space for additional students is still available.

14. Four-year institutions should become more flexible in allowing transfer credit for college-level community college courses for which there is no specific equivalent in the senior college and in permitting more substitutions for required courses. Instead of limiting the community college student to a maximum number of credits that can be transferred, the senior college should accept all college-level course work and simply require that one-half of all credits required for the baccalaureate degree to be completed at a four-year college. The net effect is about the same, but under this plan, now in effect at Western, the student is less likely to feel that he has lost credits in the transfer process.

15. The senior institution should issue a final evaluation of the transfer student's credits at as early a date as possible so that the student will know where he stands. It is difficult for the student to plan his remaining course work and, possibly, even to concentrate on his studies if he has the possibility of a loss of credits "hanging over his head" for an extended period of time.

16. When a graduate of a community college satisfies that institution's general studies requirement, he should

not be checked out on a course-by-course basis to determine whether he has satisfied the senior institution's general studies requirement. In Florida, if the student is certified by the community college as having met all lower division general education requirements, he must be given full upper-division standing by the senior college.[13] This is a sensible policy.

17. The grade point average earned at the community college should be accepted and counted the same as if it had been earned in the first two years at the senior institution. By the same token, a "D" grade earned before transfer should be considered in the same light as a "D" earned by a native student as a freshman or sophomore.

18. The admissions office of the senior institution should inform the industrial education department of the names of all of its incoming transfer students, and each of the new students should be assigned to a specific adviser in the industrial education department before he arrives on campus to register and begin classes. The adviser should be one who is familiar with community colleges and the usual problems and concerns of transfer students. In the face of so many complaints that four-year colleges and universities are taking an increasingly impersonalized attitude toward their students, this approach would be a refreshing one and, hopefully, give the students a feeling that someone does care about them as individuals.

19. Four-year colleges should analyze the characteristics and needs of their community college transfer students and then plan a special orientation program for them that is separate from the usual freshmen orientation program. Because of the usual problems encountered by transfer students, it is possible that a continuing orientation throughout the entire first year should be considered. Texas A&M conducts a special orientation in the spring for incoming community college students and their counselors. The students stay in dormitories, talk with students and their advisers, and learn something about the campus.[14] Student services personnel should make a special effort to help transfer students find a meaningful place in college life. The Office of Student Affairs at Pennsylvania State University holds an annual spring conference for student leaders from two- and four-year schools to

discuss mutual problems, plan special programs, and meet with university staff. When the students transfer, they are already in a position to assume leadership roles.[15]

20. In addition to whatever orientation program for all transfer students is planned by the university, the industrial education department should also plan its own program for the orientation of its incoming community college transfer students.

21. The senior institutions should channel back to the community college campuses up-to-date information concerning the job placement of community college alumni in the field of industrial education.

22. In states where articulation agreements among colleges are voluntary, it is important that state-wide articulation conferences by planned for the discussion of problems of mutual concern among two-year and four-year institutions. Such conferences have been held each summer for several years in Michigan, and many improvements in our overall articulation have resulted. Notwithstanding such conferences, however, a need has existed, and still exists, for each two- and four-year college to make every effort to become as fully articulated as possible with each other college with which it exchanges students.

Footnotes

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Position Paper

The Future of the Community Colleges

Lewis R. Fibel

Junior colleges have now been around for a long time. The first public junior college was probably established in Joliet, Illinois, in 1902, and many existing private junior colleges have roots that go back to the 19th century. But the community college is a more recent development, evolving from the more traditional junior college. The development took place slowly, was given impetus by events following World War II, and has really boomed in the past decade. Our statistics indicate that 500 new community colleges have sprung up in these ten years, and the annual rate of establishment is over 50 -- an average of more than one a week. According to Gleazer, in 1966, in California, Florida, and Mississippi, more students began their college in community colleges than in any other institutions. A community college is within commuting distance of almost every person in the states of New York, Florida, and California; this will soon be true in several other states as well. Especially significant has been the recent emergence and rapid growth of community colleges in major metropolitan areas -- in Miami, Dallas, Philadelphia, St. Louis, Seattle, and other cities.

What has caused this tremendous growth? More than to any other single development it can be attributed to a demand for increasing opportunities for higher education. The increasing complexity of our modern society has brought awareness that job availability is more and more dependent upon education, and that educational availability is dependent upon geographical proximity and the removal of financial barriers to attendance. This is the role that the community college fits.

Pressure by citizens for opportunities for themselves and for their children has put pressure on state legislatures and other political bodies to devise systems of higher education that would meet the needs of the people. State plans for distribution of higher education functions -- first and notably in California -- were followed by permissive legislation and financial support.

Nevertheless, there were obstacles. Not all four-year colleges and universities welcomed this new child in the family with open arms. Some feared competition; others decried a lowering of the standards of higher education -- much the same outcries made by the private schools upon the founding of the Land Grant Colleges in 1865. Taxpayers resented and resisted another tax inroad, especially on the base of the already much-used property tax. There were masses of laws and regulations that applied to secondary education that were extended to community colleges. There were frequently inhibiting, sometimes strangulating.

Despite all this, the consensus of all study groups, of the National Commission on Technology, Automation, and Economic Progress, of the President's Committee on National Goals, of the Educational Policies Committee, was that the country should attempt to provide two years of post-secondary education for all qualified students, and that the public community college was an effective instrument to accomplish this goal.

The results of planned community college growth can be dramatically seen by an example from Florida. In 1957, 33% of all first-time college entrants in the state attended the state university system, 47% attended private institutions, and 20% the public community colleges. By 1966, only 15% attended the state university, 22% the private institutions, and 63% the public community colleges.

The basic function of the older junior college was to provide the first two years of a four-year baccalaureate program. This function has continued in the community college, but there have been added a number of other functions, including the provision of occupational education, general education, remedial or development programs, continuing or adult education, community service and counseling and guidance. This array of programs has lead to the designation "the comprehensive community college."

Two points should be made, however. First, that community colleges differ in the degree to which they are comprehensive. There may be good reason because of educational structure within a community for any of these functions to be attenuated or even abandoned. Second, that community colleges have no privilege of monopoly in any of these areas. Many other kinds of educational institutions separately perform any and all of these functions. The characteristic, rather, of the community college is its housing of all the functions under one roof -- its comprehensiveness. "The comprehensive community college exists to give students the opportunity beyond the high school to find suitable lines of educational development in a social environment of wide range of interests, capacities, aptitudes, and types of intelligence."

The predominant organizational structure for the community college is a college district. This may include several school districts, a city, a county, or several counties, or some combination of these. Many community college districts are large and populous enough that several campuses or colleges are within one jurisdiction. The governing body is generally a local Board of Trustees, which is commonly chosen by the electorate, but in some cases may be appointed. There is usually financial support from local tax sources.

Within 38 of the states, the community colleges have been organized into more or less formalized state structures with a state board exercising a coordinating role. In some states (Massachusetts, Virginia, Kentucky), the state board has a regulatory role, and the local control is minimal. In virtually all the states, the state government provides financial support for operation or for capital construction or for both. There appears to be a direct relationship between the degree of state control and the extent of state financial support.

Of course, in most states, student tuition provides a substantial part of the financial support, although notable exceptions exist in California and in Chicago and New York City, where there is no tuition.

It is also important to note the increased Federal support that is available to community colleges. This importance lies not primarily in the money itself, but rather in the indication, thereby, of the value placed in Washington on the contribution of the community college. Among significant legislation affecting these colleges are the Higher Educational Facilities Act, the Vocational Education Act, the Allied Health Professions Act, and the Higher Education Act.

There are two levels of evaluation which can be used to measure the community college. One is to weigh the goals of the institution; the second is to weigh the extent to which these goals have been reached. Basic to this discussion is the axion that there is positive value in extending educational opportunity to more individuals. The value accrues not only to the individual, but also to his community, to his state, and to his Nation. (This suggests a rationale for financial support for the community college from all of these sources).

Extension of educational opportunity is related to accessibility, most usually geographic proximity. Studies show dramatic increases in college attendance after establishing a two-year college in a small city. A study of attendance in a large metropolitan area shows a direct ratio between the number of students attending and the distance that they lived from the institution. This certainly has implications for the location of campuses within a college district. On the other hand, specialized courses and programs cannot be economically duplicated at every campus or college. Accessibility in these cases may thus involve transporting students or in providing residential facilities for them.

A second factor in extending educational opportunities to more people is the reduction of the cost to the individual. A simplistic answer is to make the education available without cost (this is what we do in elementary and secondary education). This can be at the same time too much and too little, (for different individuals). It can be too much when the individual - or his parents - are financially capable of contributing. It can be too little when the additional costs of books, carfare, lunches, and the loss of money which might have been earned, prevent attendance. The State of New York has for some time provided financial assistance to students based on family income; Michigan State University has indicated that it will charge tuition in proportion to ability to pay; training programs under the Economic Opportunity Act and the Manpower Development and Training Act provide for trainee subsidies. At present, student tuition and fees at community colleges seldom exceeds $400 per year, and averages perhaps half of that. This has substantially reduced financial barriers for many people, more consideration is being given to those who are excluded by even these charges.

The third factor in extending educational opportunity is a liberalized admission policy. Most community colleges subscribe to "open-door" admission. The college will accept all high school graduates or adults beyond normal high school attendance age (usually 18) who can profit from the instruction at the institution. This, however, is a frequently misunderstood policy -- misunderstood by faculty as well as by students and their parents. It does not mean that any student shall be admitted to any course or program. It is manifestly unfair to allow a student to enroll in a course where he does not have a reasonable probability of success. It is also unfair to place a poorly prepared student in a class where he will interfere with the learning rate of the other students in the class. The phrase "reasonable probability of success" is an interesting one. It is now possible with an estimated error of less than 5%, to predict academic success in specific courses on the basis of previous achievements in school and scores on standardized tests. Most would agree to exclusion of a student when his probability of success is only 1 chance in 1000; but how about 1 in 100, 1 in 10, 1 in 4, or 1 in 2? The concommitant of admitting a study in the last category is that he also has a probability of 1 chance in 2 of failing; putting it another way, of a large group of such similar students, half will fail. Their results conflict between the sentiment that every individual should have a chance, and the hard economics of who pays for the failures.

The fourth and final factor in extending educational opportunity is the offering of a variety of programs. This follows logically from the admission policy. Opportunity should not be the opportunity to fail; it should be the opportunity to succeed. The community college will have programs that cater to a wide spectrum of interests and abilities. It will, of course, offer transfer programs that prepare the graduate to continue to the baccalaureate degree program at a four-year college or university. It will also offer occupational programs in many fields; some, probably of two years in length and resulting in the award of an Associate degree, will prepare graduates for employment as technicians or other semi-professionals; others, requiring less time and a lower degree of abstraction, and probably rewarded by a certificate or diploma, will prepare for other jobs.

Further, the college will offer a graduated series of remedial or developmental courses that will take the individual where he is and give him the necessary basic training so that he might become qualified to profit by a college experience. Added to this variety of offerings, the community college will attempt instruction using differing techniques to capitalize on individual differences, and to give each the opportunity to learn in his own style. This would seem to have particular relevance to programs for disadvantaged students, where goals and content might remain the same if methods of instruction were changed.

Finally, the success of the entire operation will depend significantly on the counseling and guidance program whereby the college helps to identify the special interests and aptitudes of each student, provides him with information about the curricular and occupational choices that are open to him, and then aids him in making pertinent decisions.

All of these factors together will ensure a substantial expansion of educational opportunity.

The best available statistics, and these hold only nationally and not for individual institutions, show that two out of every three students that enter community college plan to transfer after graduation to a senior institution and work towards a baccalaureate degree. In fact, only one out of three do transfer (and about 80% of those do earn the bachelor's degree), but it is interesting that those who do transfer come both from the group that entered with that intent, and from the group that entered without it.

In any event, one of the big challenges facing the community college is to provide meaningful education for the two-thirds who do not transfer. In most cases, this education should be related to an occupational opportunity that would be available after two years (or less) of post-secondary education. They need jobs! The response of the community college has been the development of a large number of occupational curricula.

The most significant aspect has been new curricula for the preparation of technicians or other semi-professionals. The increased complexity of our technology and the shortage of qualified professionals in many fields has given rise to a new middle level of manpower. In engineering, the engineer requires more sophistication in mathematics, and a higher level of abstract reasoning; he has become virtually an engineering scientist. A new breed of engineering technician has evolved to perform the more routine jobs in production, testing, and drafting that were formerly done by engineers.

In medicine, the physician no longer can give reliable health care as an isolated general practioner. He now needs the help of a team of health auxilliaries, ranging from well-established and well-recognized assistants as nurses, medical laboratory technicians, and x-ray specialists to newer and more esoteric technologies such as surgical, inhalation therapy, medical emergency, and bio-electronics. (This last is an individual concerned with the operation and maintenance of the complex electronic equipment now used extensively in both diagnosis and therapy.)

In business, the growth of the computer has produced needs for persons who can operate, program, and maintain these instruments. Mid-level management positions in general business areas; specialists in insurance, banking and real estate; persons qualified to work in supermarkets or hotels and restaurants -- all are in short supply.

In the public service, such positions as police and fireman now frequently require the additional education that can be acquired through study to an Associate degree. Further, corrections officers, traffic specialists, planning officials, and others require trained support staff. The entire area of teacher assistants and other educational auxilliaries has scarcely been touched.

In all these, and in other fields as well, community colleges have established programs. The most recent edition of American Junior Colleges lists over 100 major categories of occupational programs at two-year colleges and each monthly issue of the AAJC Occupational Education Bulletin makes new additions to the list.

Development of occupational education in the community college not only has potential for solving manpower problems of employers, but it can also provide the opportunity for meaningful jobs for students, which, perhaps are better related to their interests and abilities than are professional positions. Nevertheless, it must be admitted that most occupational programs are not oversubscribed by applicants. The pervading mores of our society emphasize top-level and professional positions. Students and their parents are not turned on by technician jobs. "Oh, they are fine for the person down the block, but not for me or for my child."

This influence is hard to combat. It requires most likely the development of career and curriculum ladders, where the technician position is one of the entry points, but where opportunity exists, perhaps with further education, for both horizontal and vertical mobility. The beginnings of such developments are visible in New Careers programs on one hand, and in baccalaureate technology programs on the other.

Much of the difficulty in the development of occupational programs lies wholly within the educational community. High school teachers and counselors, themselves products of graduate study at the university, have been reluctant to recommend technical education to their students. The community colleges have not established good relations with the high schools either in helping with the high school guidance function, or in creating occupational programs that span high school and community college years, drawing upon the high school experience to expand and enrich the potential of the community college.

Nor has sufficient liaison been established with four-year colleges and universities. I have alluded to the possibility of baccalaureate programs in the technologies whereby the basic technical component of the Associate degree can be capped with courses leading to related careers in technology, management, or teaching. These routes should be open to all students, although it would be anticipated that they would be taken by only a few.

Even within the community college itself, academic faculty have often not accepted their technical brethren whole-heartedly. Promotional policies frequently favor graduate study over practical experience, to the detriment of the technologists. This may be changing as semi-professional positions are evolving from social science and communication fields, and the entire faculty becomes involved in technical education as well as in general education.

A second determinant in community college curriculum is the provision of continuing education. There is certainty today that no one will ever "complete" his education and that there will be demands for vocational, avocational, and cultural courses throughout the lifetime of the individual. By offering courses of shorter or longer duration, throughout the day and evening, even on week-ends, and all through the year, the community college has responded to this demand. These classes may be for credit or not-for-credit. They may be only a single lecture, a series of lectures, or a class meeting for an entire semester. The offerings may parallel the "regular" offerings of the institution or they may be vocational in nature, providing for the training of skilled workers, the upgrading of technicians, or the refurbishing of professionals. They may be avocational to develop leisure time pursuits from archery to zoology. They may be contributions to the political, social, or economic life of the community. The students who enroll may be from 16 to 60.

This, then, is the community college of today: an institution that will vary in character from one part of the country to the other, but which generally is one that will reject no service that it can offer to the community that established it.

What of the future? My crystal ball is no better than that of many others. When I look into it, some things are clear, but others are very hazy. Obviously what follows is opinion, based on personal observations and experiences and reflecting personal prejudices. The time span I am looking at is roughly the next thirty years, until the beginning of the twenty-first century.

First, I believe that there will be an increase in the number of community colleges until the pattern of Florida and California of providing an institution within community distance of virtually every individual is achieved nationally. I estimate that this will require approximately 2500 colleges, 1500 more than now exist, suggesting a continuation of the growth rate of an average of 50 new institutions a year for the rest of this century. After that time, I predict that the rate of establishment of new colleges will decrease.

Secondly, I believe that there will be more students attending college. This will result both from a growth of population and from an increasing proportion of the population attending college. Although enrollments in four-year colleges will grow, I predict that the enrollment growth in two-year colleges will be proportionately much greater. The community college will serve a much larger group of the population.

With regard to organizational structure, I see complete elimination of all administrative linkages of community colleges to high school districts. I believe that the predominant organizational unit will be the separate, independent junior college district. Most of these will remain coterminous with conventional political divisions--the county seems the most logical choice in most of the country. Both population and geography problems in many of these districts, however, will tend to produce multi-campus or multi-college establishment. There are a number of existing districts that are probably too small now to mount a good community college program. Nevertheless, I expect that parochial loyalty will prevent much amalgamation of small districts into larger ones.

I think that the pattern of financial support will follow fairly closely that which currently exists, with student, local community, and state all contributing. Among these sources, I expect that the state share will tend to increase relative to the other two. Obviously the cost of community college education is going to increase both in terms of present day dollars and in absolute amounts. Federal aid is likely to increase, but I believe that it will stay predominantly categorical rather than general. There is, of course, pending legislation that would greatly increase Federal general support of community colleges, but I believe that the likelihood is that this money, if it becomes available, will be channelled through the states in accordance with state plans. I believe that there will be a substantial increase in student-support programs, including work study and cooperative education as well as loans, scholarships, and stipends.

With or without any substantial increase in state-support formulas, there will be heavy pressure to increase control by the states. This may take the form of State approval for curriculum establishment and standards for such diverse matters as building specifications and faculty qualifications. Some of this may result from natural self-justification on the part of state bureaucracies, other will be a genuine, selfless attempt to provide a comprehensive State plan of higher education. The State will exercise control to prevent needless proliferation of specialized programs for which there is only limited manpower need and student demand. The State will also tend to require that specialized educational opportunities are not limited to students because of their geographic location.

Such control may require, at the same time, that the State subsidize transportation and residencies for students who are thus affected, and charge-back authorization to reduce the financial strain on a particular local district.

Effective voluntary cooperation among community colleges can delay the establishment of strict State control. The development of consortia would seem a significant movement in this direction.

There are two pressures that will tend to work somewhat in the opposite direction to more centralization. These are faculty and student militancy. Both are already quite evident. Faculty militancy will press for individual and institutional automony to set course requirements, determine grading standards, select texts, and establish curriculum. I believe that faculty will be successful in these demands, but that in the time span I am discussing, they are not likely to be too successful in having a larger voice in broader policy matters. Also, the faculty is likely to become more significantly involved in the procedures of hiring, retaining, and promoting faculty. This may well result in replacement of like by like, a uniformity -- philosophically -- among faculty, and maintenance of the status quo.

Student militancy, I believe, will emphasize student control over student activities and regulations, and will take political postures on such matters as minority rights and militarism. The community college students, generally, are not likely to become leaders of militant student groups; they are more apt to imitate what is done on other campuses.

Perhaps the most striking change that is likely in community colleges is in the instructional methods, materials, and techniques that will be used. I don't see the probability of abandonment of conventional lecture and discussion sessions as we know them today, but I do see extensive supplementing of them by various types of individualized instruction. The most used will probably be audio-tutorial systems involving video and audio tapes, film loops and slides, and programmed instruction books. The student will use these devices to review material, to make up deficiencies, and to further explore his special interests. I foresee an increase in applications and hands-on experiences, both in the laboratory and in extended campus facilities (as an extension of cooperative education utilizing the plants, offices, and hospital facilities of the community). It doesn't seem likely that computer-assisted or computer-managed instruction will have widespread adoption because of the great expense involved. Of course, all of these devices are already being explored in some colleges. The net result and the great advantage, I believe, is that we will be relieved from the necessity of fixed starting and ending points, in a course, and only one rate of progress. We will be able to take the student where he is, and let him learn - at his best pace and in his own style - to the extent that he is capable. Hopefully, this can lead to an easing of strict course credit structure, and permit us to give credit for learning regardless of where or how the learning has taken place.

Again, this has further implications. One is the development of valid and reliable testing procedures. There is need for tests that will measure what a student knows on entrance to the college and for other tests that will measure both his aptitudes for further learning and his style of learning. At intervals during the course, tests will weigh the amount of learning that has taken place, and will suggest review, remedial, and enrichment programs for the student. Finally, tests at the end of the curriculum will measure student achievement both for his own sake and as an indicator to employers.

Second, these techniques will make more feasible articulation across the educational range from high school through community college to university. We can then stop worrying about appropriate levels of education. It won't matter, e.g., whether calculus has been studied in high school, in community college, or in the university. We will be able to construct individual programs based on information relative to past progress and with varied content, dependent on interests and aptitudes. Plugging into such a system with continuing education programs would again appear to be reasonably simple. I would point out that my prediction is much simpler and involves much less sophisticated hardware and software than some seers are suggesting.

With regard to curriculum, I predict that all of the present functions of the community college and the programs to implement them will continue. However, I see a shift in the proportions of the enrollments in each type of program. I believe that proportionately there will be fewer students enrolled in the transfer curriculum (particularly in the present day liberal arts and pre-professional curricula), and more in the occupational curriculum. However, the distinction between these two tracks will become hazy, as students will regularly travel back and forth across the boundaries. The spectrum of occupational offerings in the community college will be widened, both horizontally and vertically. The horizontal broadening will lead to perhaps 8-10 programs in each of (the) 4 or 5 major divisions in a moderate sized college, while larger ones will have 2-3 times that number. Vertical growth will result in a family of occupations within a specialty that could provide multiple convenient exit points. Core curriculum or extensive commonality of courses will increase, allowing postponement of terminal career choices and flexibility in all directions. Regional planning and exchange agreements will provide comprehensiveness for smaller institutions.

I believe that the single largest function of the community college will become the preparation of technicians or other semi-professionals. I predict a substantial increase in the demands for this type of individual as technological developments cause industry to differentiate staffing patterns and call for new specializations. The community college would seem to be the institution best qualified to undertake this extensive job.

As I have suggested before, I also believe that there will be substantial development of baccalaureate programs in technology, so that occupational programs will become even less "terminal" than at present, and it will become commonplace for Associate degree graduates in occupational curricula to go on to the baccalaureate.

On the other hand, community colleges will also proliferate occupational programs at less than Associate degree level, remedial, developmental, and bridging programs of many kinds, and an assortment of continuing education. The growth in size and diversity of community college programs suggests an increasingly important role for the guidance and counseling staff.

In summary, the years ahead will offer great challenge and much excitement for those involved in community college education. The tempering factor, I believe, will be a demand by the public for accountability by the colleges. The faculty will be expected to be able to evaluate the results of program and to present objective evidence of the extent to which specified goals have been achieved. This will, at first, tend to be restrictive, but as valid evaluative techniques are developed, I believe that it will promote innovative practices.

The community college is coming of age. It has before it both the delights and the responsibilities of adulthood.

Conference Proceedings--Study Group Reports

As indicated earlier, the main concern of the work-study conference participants was to take part in study groups to more carefully examine an assigned topic. These topics were as follows:

1. Focus on the Problem
2. Curriculum Planning
3. Articulation of Courses and Curricula for Industrial Teacher Preparation
4. Staff
5. Technical Laboratory Facilities
6. Guidance and Counseling
7. Admission and Transfer
8. Students
9. The Future--Adapting to Change

In each case, the groups developed a rather detailed outline of the salient issues involved in their study topics. These were expanded and elaborated upon to present a document which would reflect both the thinking of the group members and the available research and survey information. The groups were also responsible for the preparation of charts, if any, and the identification of suitable illustrations to accompany their written materials. After a rather careful examination of these documents by the entire group, they were submitted to the project directors and served as the basis for the development of the final guideline bulletin.

Evaluation of the Tentative Guideline Bulletin

After the project directors had reviewed the materials carefully and done some preliminary editing, a tentative guideline bulletin was assembled, duplicated, and disseminated to all conference participants. These individuals were instructed to examine the total document for the purposes of making corrections, additions, deletions, or possible changes in the format. The results of this evaluation were utilized by the project directors in the production of the final bulletin.

SECTION FOUR
EVALUATION OF THE GUIDELINE BULLETIN

To evaluate the effectiveness and usefulness of the guideline bulletin, "Partners in Industrial-Technical Teacher Education/The Cooperative Roles of the Community-Junior Colleges and the Senior Institutions," a survey form was developed (See Appendix for sample.) which was sent to four major groups that participated in early surveys concerning the present status of articulation. A copy of the Bulletin and a survey form were sent to the following groups:

1. Heads of industrial education departments at senior institutions
2. Admissions offices in senior institutions
3. Community-junior college counselors
4. Deans of technical studies at community-junior colleges
5. Others (This group included the personnel who participated in the Work-Study Conference and state directors in the six states involved.)

It was originally intended to compare the results of evaluation by dividing the returns into five major groups:

1. Total reaction
2. Reaction of the department heads in the senior institutions
3. Reactions of admissions offices in the senior institutions
4. Reactions of the community-junior college counselors
5. Reactions of deans of technical studies in community-junior colleges

However, the results were so similar that there was no need for this more specific analysis. In tabulating the results, the evaluation ideas were divided into four major groups; namely,

A. Articulation Problems

B. Evaluation of Recommendations

C. Present Plans for Partnership and Pyramid Programs

D. Overall Reaction to the Bulletin

Articulation Problems

To the question:

> Do you believe that the C-JC should provide technical and professional courses for students planning to complete a degree at an SI?

the respondents answered affirmatively (89 percent), while 4 percent ignored this question. Of the remaining 7 percent, about half indicated that professional courses should be taught at the senior institution only and that the community-junior college should concentrate their efforts in the technical area. It is apparent that the great majority of professional personnel both at the community-junior college and senior institution realize that to be effective the community-junior college must have a two-year program for industrial teacher preparation which is equivalent to the first two years that can be obtained in senior institutions.

To the question:

> Are regular meetings held between personnel of the SI and C-JC in your area to discuss the articulation of programs for preparing IE teachers?

61 percent of the respondents indicated that there were no regular meetings, while 33 percent said that meetings were held but not on a regular basis. Six percent did not respond to this question. Obviously, one of the major problems in developing any coordinated and articulated program whether it be in industrial teacher preparation,

industrial technology, or any technical area is the need for regular meetings between professional personnel to discuss their problems. The directors of this project have found in meeting with school personnel at many community-junior colleges and senior institutions that one of the greatest problems faced by both groups is the lack of information about the other institutions. The constant complaint is that there is no plan for getting professional personnel from both institutions together even though the total education program of more and more students completing a degree will be a dual responsibility of the community-junior college and senior institution.

To the question:

> Do you believe the implementation of the guideline recommendations will improve the articulation between the C-JC and SI?

the overwhelming majority of the respondents (91 percent) indicated that they believed that the use of this Bulletin would improve the problem. Only 3 percent answered negatively and 6 percent did not respond to this question.

To the question:

> Will this guideline bulletin affect your future plans for cooperating in IE teacher preparation programs?

69 percent indicated that it would affect their future plans, while 18 percent felt that it would have no effect on their plans. Thirteen percent did not respond to this question. Obviously while more professional personnel believed that the implementation is essential, some feel there is a wide "gulf" between the two institutions that must be bridged.

Evaluation of Recommendations

The single question listed below attempted to get at the problem of how useful each section of the Bulletin would be to the respondents. Two sections; namely, curriculum and counseling and guidance were given a slightly less favorable evaluation. However, in analyzing this by groups, 64 percent of the counselors in community-junior colleges listed the curriculum as excellent and 58 percent felt that counseling and guidance was also excellent. Those professional personnel who work most directly with the students find these sections very valuable.

How do you evaluate the usefulness of
the information and recommendations
dealing with:

Exc.	Fair	Poor	No Response	SECTION ON:
64	27	1.0	8.0	Focus on the Problem
52	41	.4	6.6	Curriculum
55	36	.4	8.6	Articulation
53	34	3.0	10.0	Staff and Facilities
51	38	4.0	7.0	Counseling and Guidance
55	34	3.0	8.0	Student Transfer and Adm.

Present Plans for Partnership and Pyramid Programs

To the question:

Do you presently have or are you
planning an arrangement between
the C-JC and SI in your geographic
area that follows the general
guidelines listed under the:

Have			Planning			
Yes	No	No Response	Yes	No	No Response	PARTNERSHIP PROGRAM
26	45	29	18	41	41	

Have			Planning			
Yes	No	No Response	Yes	No	No Response	PYRAMID PROGRAM
24	36	40	22	36	42	

Much work needs to be done to implement these programs throughout the country and particularly in the six states involved in this study.

To the question:

> If a Partnership Program were established in your area, should there be:

Yes	No	No Response
65	20	15

New professional courses at the C-JC, such as Introduction to IE

Yes	No	No Response
87	5	8

Seminars for counselors in C-JC and SI

Yes	No	No Response
85	6	9

In-service programs for technical teachers in C-JC and SI

The majority of the respondents indicated they would like to see the above suggestions put into practice. To implement these three recommendations will require additional organization and direction. Special attention must be given to these problems in the years ahead.

Overall Reaction to the Bulletin

The major question:

> What is your over-all reaction to the bulletin in terms of comprehension, utility, accuracy, and presentation?

showed that 67 percent said the Bulletin was excellent. Twenty-four percent indicated it as fair. Only one percent answered poor, and 8 percent did not respond to the question. The following specific comments and reactions are typical of those answering the survey form.

From Department Heads:

Rather than be overly concerned with guidance at the junior college, an introductory course (Survey of Industrial Education, perhaps) would be most effective as an elective. There is also a problem in separating technical skills from pedagogy in our Dean's mind. This is why industrial school experience is not accepted for credit. Some real selling must be done on this 'competencies' angle.

An excellent piece of work!!!

It appears the element of flexibility in course transfer to a college has been overlooked. There are a variety of technical programs offered in the J.C.'s. A student would be able to transfer all his work without being penalized. This facet should be considered in articulating across the board with senior institutions.

1. C-JC should not offer senior level courses such as 'Methods.'
2. SI students should be able to 'go back' to C-JC for certain junior level and technical course work but no tuition agreement can presently be made because of legal problems.

We have a program especially designed for Junior College transfers who have earned the Associate Degree in a technical program. They do not lose any credits classified as college level credits by the junior college in its catalogue. We also have a similar program here on campus. That is, we are authorized to offer the associate degree in technology.

It looks well done and well presented. I've received some negative comments on the use of yellow--tends to fade into background and a little difficult to read.

I find the content and presentation excellent.

From Department Heads Contd.:

Inservice programs needed for I.A. teachers to update content and skills pertaining to analyses based on industrial technology—not trades. In-service seminars needed for counselors to inform them of nature and characteristics needed in prospective teachers of up-to-date I.A.

From Community-Junior College Counselors:

There are no reasons why we could not establish a channel of communication between ourselves and the Senior Colleges or Universities in the area in order to attempt to achieve the pyramid program approach.

The reality of the situation is that many of our students attend one year in a 2 yr. tech. program before they decide to become teachers. These students still lose credit when they transfer. I believe the intellectual snobbery that allows the 4-year school to arbitrarily reject credits from a community college technology program does little to aid the students of our state!

Because many C-JC personnel are primarily concerned with transfer programs it could be that this effort would have many additional benefits for IE at the C-JC.

I think that sometime this summer there should be an effort made to draw up an articulation agreement and formulate some parallel course equivalent sheets between the SI and C-JC.

Excellent bulletin--provides a good model for a college such as ours--4 years old, new and developing programs. Articulation in (our state) is improving and frankly the SI have treated our industrial transfer students very well on an individual basis, however, a broader program commitment is needed.

From Community-Junior College Counselors Contd.:

Thank you--this publication is outstanding. I will use it to start the 'creative' process toward a up dated Vocational-Technical curriculum.

I think that this is an excellent resource book. As I expressed on the other side, in order to initate a program that you described, it would take the combined efforts of our Board of Trustees to set priorities, our President to encourage a start in this direction, and the cooperation of staff, counselors, high school and senior institutional representatives to carry out the program.

The problem, as such, was defined, however, it would seem that the reason for its being would have been helpful in understanding the need for a solution. Also the implications involved in 'the problem' as it relates to our technological society might have increased its stimulus potential.

As previously stated in the guidelines, more courses of the technical or technology area should be offered in the first two years of J.C. Be pleased to assist in any way possible.

At the present time the vocational-technical programs are geared toward job entry after the specialized vocational courses in the C-JC. A cooperative program in voc.-tech. areas could provide more teachers if students could take some voc.-tech. courses that transfer to SI.

Many of our voc.-tech. people at the C-JC do not endorse IE because of varying rivalries and jealousies. We presently have about seven voc.-tech. courses (introductory) to our primary SI.

From Community-Junior College Counselors Contd.:

> We have been working with SI in our area for years. State colleges are easy to work with, but the Universities do not offer training in I. Ed. for teachers. We have just scratched the surface in this phase of education. I.E. area lacks prestige with some people.
>
> As a C-JC counselor I have also found that there is a great need to provide high school students more occupational information while they are still in high school. Most students coming from high school have not been provided with the occupational information they need. As a result I have talked with many students who have started a vocational program (2 yr.) then decide to go to a senior college resulting in a loss of credit hours. (This is another place where the partnership plan would help.)

From Deans of Technical Studies:

> I am pleased to see such a definitive survey, so well written and attractively done.
>
> We would prefer pyramid approach. The associate degree should be accepted by SI. The CC have good programs and students are embarrassed when credits and degrees are not accepted. In addition, the CC is more likely to have the facilities and equipment to teach the technical phases of the program. One SI could then build on this as the study indicates. This study is valuable and its implementation would provide impetus in the solution of a major problem. But much cooperation is needed with some compromises a necessity.

From Deans of Technical Studies Contd.:

A great deal of valuable information is provided in capsule form--an excellent presentation.

The entire publication has been most helpful in the development of an Ind.-Tech. teacher program. My problem is will they be willing to accept the tech. ed. hours at the senior institution. (# of sem. hrs. that will be transfer in tech. courses)

Well accepted and professionally done. Lets push this program to a professional level. The 4 year schools should invite the Jr. College to their meetings and not give us that 'superior to' approach.

Perhaps redesigning existing technical courses in C.C. would serve these purposes better than creating new courses. Many C-JC have excellent facilities--lets use these to a greater extent for exploratory courses as an introduction to I.E.

In general, is role of C-JC primarily a feeder station for SI? I think not. But, if students show interest or desire to go on, then appropriate advisement is made. Unfortunately, too many students change their career goals in the 4th semester, thereby increasing the transfer credit dissatisfaction. This point plays a major role in the 'unhappiness' among our graduates but glossed over by many evaluators.

Will also use it with H.S. relations.

The kind of relationship between SI and C-JC as proposed has been long overdue, I am encouraged by it.

I will use the information on relationship of Jr. College to Senior Institution many ways. Thanks.

From Deans of Technical Studies Contd.:

We must orient the counseling Dept. to do a more effective job.

This is a sharp focus on the I.E. shortage and here it will be used to encourage administrative support to develop the many suggestions. Excellent presentation.

From State Department Officials:

There needs to be cooperation between State Education Departments and both SI and C-JC if a valid program is developed. Very little is said about involvement of local administrators of Voc. Ed. in planning.

I hope this bulletin gets wide distribution. It exactly points up the problems now existing and gives credence to the only way to solve them. We are dragging our feet and maybe this report will give us the needed push!

SECTION FIVE
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Summary

This study was made to investigate ways of improving the quality and quantity of industrial education teachers in California, New York, Texas, Illinois, Michigan, and Florida. These states were selected because:

*They are six of the nine largest in population;

*They have about one-third of all the public community-junior colleges in the United States.

The shortage of qualified industrial education teachers is an especially critical problem since it is estimated that 100,000 new degree teachers of industrial education will be needed during the next five years in the United States.

The principal thrust of the study was to examine approaches for utilizing staff, facilities, counseling services, and programs in the community-junior colleges for preparing industrial education teachers. All catalogs from community-junior colleges and senior institutions were analyzed. Surveys were sent to industrial education department heads, admissions offices and transfer students in industrial education at the senior institutions; and to counselors and deans of technical studies at the community-junior colleges. The results revealed the following about:

*Curriculum—Many vocational-industrial and technical courses offered in the community-junior colleges have the same kind of content as those offered in the senior institutions for industrial education. There are, however, very few pre-industrial education curriculums presently offered in the community-junior colleges.

*Articulation—A need exists for improving the articulation between the courses and programs in the community-junior colleges and the senior institutions for preparing industrial education teachers.

*Staff and Facilities—About half of the vocational-industrial and/or technical staff in the community-junior colleges hold B.S. degrees in industrial or vocational education. Facilities are available in most community-junior colleges for offering many courses--principally in metalworking, drafting, and electronics.

*Counselors—Counselors need better and more information concerning such matters as definitions of industrial education, job offerings, current curriculum data, course equivalency, admission requirements, schools at which industrial education is available, and transfer student performance data.

*Students—Seventy (70) percent of the students majoring in industrial education are transfers from community-junior colleges. About 50 percent made this career decision during or after their community-junior college experience. The most pressing problem students face is the loss of credits when transferring to the senior institution.

Based on the information:

A work-study conference of representatives from the six states developed the Guideline Bulletin. These leaders recommended two innovative approaches for preparing industrial education teachers in the years ahead. They are identified as the PAP (Partnership and Pyramid Programs).

The Partnership Program, (two and two) is a planned curriculum developed cooperatively by the community-junior colleges and the senior institutions with a structured pre-industrial teacher program at the community-junior college. It is designed as another career opportunity for students wishing to take vocational-industrial and technical classes. This two-year curriculum should be accepted at the senior institution as the first two years of a degree program in industrial education. It is designed for students who decide to become industrial education teachers before entering community-junior college.

The Pyramid Program (two plus two) is a plan for building a four-year industrial education degree on the A.A.S. in Technology. The senior institution would tailor a program for the technical graduate, building on his technical competencies such additional courses in mathematics, science, education, and general academic as are needed to prepare him for teaching in vocational-industrial or technical education. It is designed for students who decide to become teachers of industrial education later in their community-junior college experience or before they enter the senior institution.

If quality programs of industrial education—industrial arts, vocational-industrial, and technical education—are to grow and flourish in the years ahead, these two new teacher education approaches must be implemented in the six states covered by this study and all other states in which the community-junior college is becoming a dominant part of the total educational scene.

The Conclusions

The conclusions reached(based on a review of research and a survey of the problems) are outlined in detail in the Guideline Bulletin—Partners in Industrial-Technical Teacher Education/The Cooperative Roles of the Community-Junior Colleges and The Senior Institutions. The reader should refer to this publication which appears in the Appendix of this report.

The Recommendations

The following recommendations which are listed in detail in the Guideline Bulletin should be implemented as follows:

1. Establish pre-industrial curriculums--Partnership Program--in community-junior colleges with senior institutions that have strong teacher preparation programs in industrial education. If the Guideline Bulletin is to have an impact on the quality and quantity of industrial education teachers, it is essential that the articulation agreements be planned and implemented between community-junior and senior institutions in all geographic areas. Research has indicated that most transfer students in a specific senior institution come from three or four community-junior colleges in their immediate geographic area. Therefore, the model for the Partnership Program should be one senior institution and four to six community-junior colleges in the immediate vicinity.

2. Course materials for professional courses dealing with the areas of the world of work and industrial education teaching are needed for the community-junior colleges. One such course titled, "Principles of Practical Arts, Vocational, and Technical Education for Community-Junior College Students" should be designed to orient the community-junior college students to the total occupational opportunities related to the teaching of any of the occupational areas. This course should include an overview of the areas of vocational-industrial, agriculture, business, distributive, health, and related areas. Special emphasis should be directed toward giving students an understanding of the world of work. A second course should be "Industrial Education for Community-Junior College Students." There is a great need for this professional course which will orient students toward the teaching of industrial education and also aid in recruiting, counseling, and coordinating programs between the community-junior college and senior institutions. A course of this type,

taught by one of the qualified staff members in the technical area, would improve the articulation between the community-junior college and the senior institution since the instructor would have to be well acquainted with the needs and problems of industrial education. The units included in such a course would be:

   a. Opportunities in industrial education--information about supply and demand of teachers.

   b. History and development of industrial education including definitions of industrial arts, vocational-industrial, and technical education.

   c. Industrial education teaching as an occupation.

   d. Courses and programs that can be completed at the community-junior colleges.

   e. Opportunities for completing a degree at the senior institution.

   f. Teacher certification and placement.

   g. Graduate work in industrial education.

3. There is need for an industrial education handbook for the community-junior college transfer students. This handbook should be designed and developed for every community-junior college that is establishing Partnership and Pyramid Programs with the senior institution in their area. The handbook should help the student with such planning as:

   a. Career

   b. Determination of his majors and minors

   c. Information that would facilitate transfer from the community-junior college to the the senior institution.

4. Recruiting materials including a descriptive folder and a film tape on "Your Future in Industrial Education" should be developed that can be used with high school students in the area of the community-junior college. This material would provide a smooth transition for students from the high school to the community-junior college to the senior institution.

5. There is need to develop and implement model Partnership and Pyramid Programs at senior institutions that do not have any industrial teacher preparation at the present time. Several states that have growing programs in the community-junior colleges, such as Alaska, Hawaii, and Nevada do not have any industrial teacher preparation programs of their own at the senior institutions. There are other large industrial areas, such as that represented by the Southeastern area of Florida that have no industrial teacher preparation programs. These settings would be ideal for developing model programs to utilize the staff, facilities, programs, and consulting services of the community-junior colleges for the first two years of the industrial teacher program. The senior institutions would not have a physical plant for laboratory classes in technical areas; therefore, pre-service and in-service classes for industrial education teachers would have to utilize the physical plants of the community-junior colleges, area vocational schools, or the better senior high schools. Professional, academic, and education courses could be provided in the senior institution. The following would be the procedure for developing programs for new areas:

   a. Develop a task force of representatives from the senior institutions, community-junior colleges, and the county and city administrators of public education.

   b. Study the needs and plans for developing future teachers of industrial education for that area. A survey of supply and demand should be made to identify the kinds of teachers in short supply.

   c. Survey the physical facilities, courses, and programs presently offered by the community-junior colleges, vocational centers, and the large high schools to determine how these may be utilized in preparing industrial education teachers.

   d. Develop four-year Partnership and Pyramid Programs for these areas following the recommendations of the Guideline Bulletin.

   e. Implement these programs by getting the necessary courses started, articulation agreements signed, and recruiting underway.

   f. Establish internships in industry and teaching for students in industrial education.

6. Develop in-service seminars for guidance counselors in high schools, community-junior colleges, and senior institutions to provide a better understanding for those professional personnel who must work with students wanting to prepare for occupations relating to the world of work. One of the critical problems in the educational system is the lack of adequate vocational guidance counseling. Research has pointed up the fact that guidance counselors are not well prepared to offer accurate information for students who are interested in technical occupations including the teaching profession in industrial education.

7. There is need for a counselor's handbook for high school, community-junior college, and senior institution counselors covering the areas of industrial education teaching and other related programs, such as industrial technology.

8. There is need to develop in-service technical education pilot programs for teachers. Technical teachers in the community-junior colleges and senior institutions need to upgrade their competencies and to exchange information about courses and programs. The research indicated that department heads in senior institutions believe that this is the best method of articulating the technical programs.

9. Evaluate the effectiveness of the Partnership and Pyramid Programs. Long-term plans should be made to evaluate how effective the Partnership and Pyramid Programs will be in improving both the quality and quantity of industrial education teachers. More comprehensive data must be gathered in follow-up surveys to provide feedback in modifying these two programs.

10. Develop a national center for identifying the supply and demand for various types of industrial education teachers. The problem of the shortage of industrial education teachers will be with the profession for many, many years. With projected increase in the community-junior college enrollments and the increase in demand for all types of industrial arts, vocational-industrial, and technical education teachers; the need for balancing the supply and demand will be a serious problem. Teacher mobility is also a factor that may affect supply and demand. At present, there is no national information as to the need for and the supply of specific types of industrial education teachers. For example, it is impossible to secure reliable figures from any national office as to the number of electronics teachers needed and the number being produced each year.

    There is need to establish feedback procedures from college placement centers, senior institution department heads, high school administrators and counselors, and community-junior college administrators and counselors to update them on the supply and demand needs for teachers of industrial arts, vocational-industrial, and technical education. This feedback information should provide supply and demand figures not only by the total areas but also by specific subject matter, such as automechanics, carpentry, machine shop, general metals, construction, manufacturing, etc.

APPENDIX

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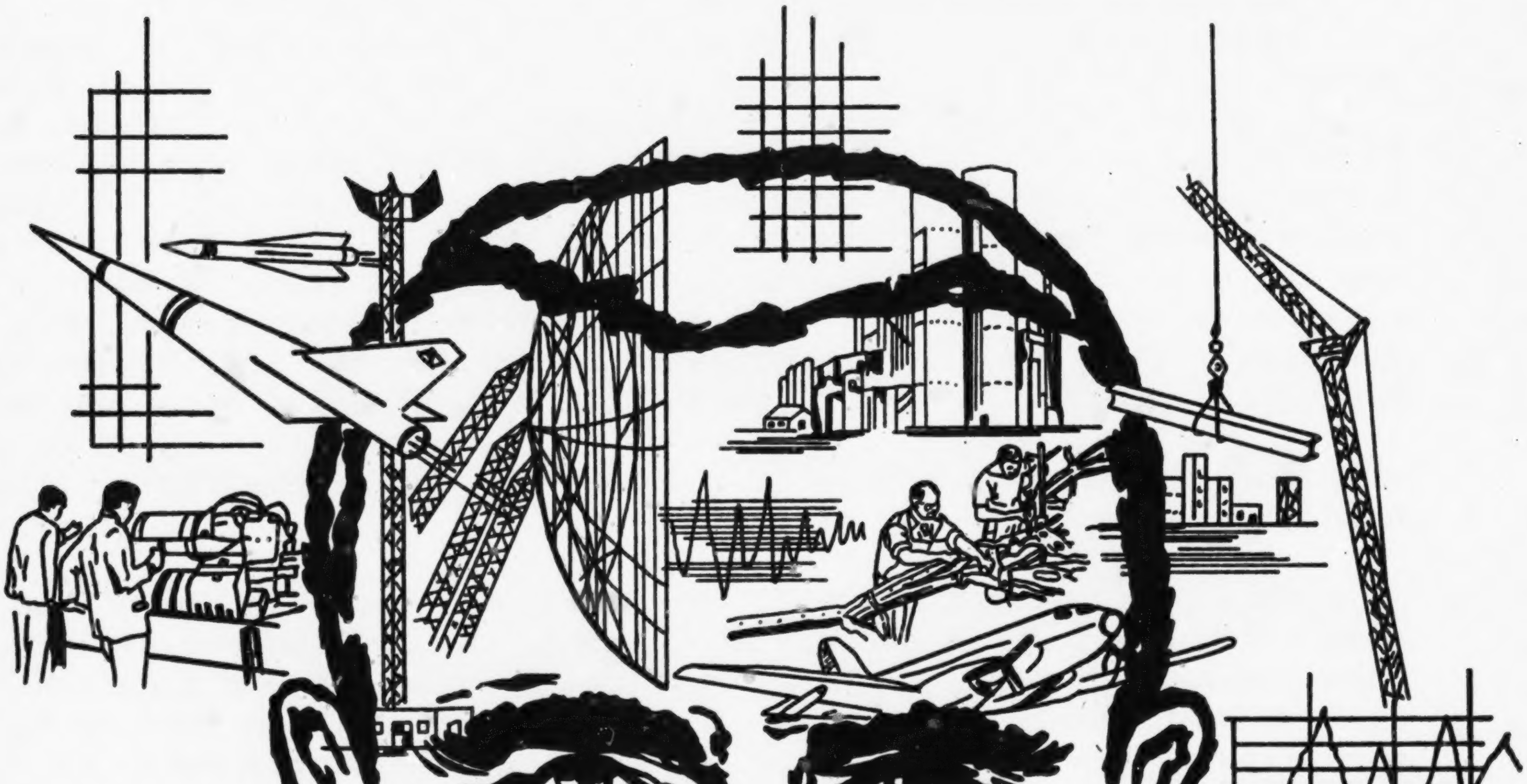
A STUDY OF
A
PRE-INDUSTRIAL TEACHER CURRICULUM
FOR
COMMUNITY-JUNIOR COLLEGES

Conducted By:

Industrial Education Department
Western Michigan University
Kalamazoo, Michigan 49001

Careers In Industrial Education



Department Head Questionnaire

480-481

WESTERN MICHIGAN UNIVERSITY

DEVELOPMENT OF JUNIOR/COMMUNITY COLLEGE CURRICULA
FOR FUTURE TEACHERS OF INDUSTRIAL EDUCATION

KALAMAZOO, MICHIGAN
49001

USOE Sponsored Project # 7-0074
Grant # OEG-0-8-070074-3713 (085)

Investigators:
Dr. John L. Feirer
Dr. John R. Lindbeck

States Included
California, New York, Texas,
Illinois, Michigan, and Florida

Dear Teacher Educator:

The following questionnaire may look both long and formidable, but it goes quickly. Its concern is primarily with an action program of extreme importance to you and to your future students.

Yours is one of the states in which the rapid growth of community-junior colleges is having a great impact on the preparation of industrial, vocational, and technical teachers. We are sure that you share with us the concern for developing better articulation between the technical work offered in the community-junior college and the preparation needed for good industrial education teachers. Therefore, we are inviting you to participate in this six-state study to develop a pre-industrial education teacher curriculum for community-junior colleges. This study is supported by funds from the U.S. Office of Education. The final report, which will be available to all who are interested, will contain conclusions and recommendations based on your responses and on the results of a work-study conference that will be held on our Campus in May of 1969.

This study is going out to the department heads in all of the senior institutions in the six states that involve industrial arts, vocational, and technical teachers. The accuracy of our findings will depend on the cooperation of everyone who has been invited to participate. We are well aware that you are frequently asked to respond to surveys and that the task oftentimes seems burdensome. However, since this study will have an impact on your day-to-day job in the years ahead, we hope that you will be interested in it. We welcome any additional comments you may have about the study and hope that the final report will be as valuable to you as your cooperation is to us.

Thank you for your help,

John L. Feirer
Study Director

jat

DEPARTMENT HEAD SURVEY

Departmental Information

Your name____

Name of institution____

Street or post office address____

City________________County________________State______________Zip_______

1. Total number of majors in Teaching of Industrial Education___________

2. Total number of community-junior college transfer students___________

Evaluation of Transfer Credit

3. Does your institution maintain an "open door" admission policy for all graduates of community-junior colleges in your state?

   Yes..........1   No..........2

4. Indicate the individual or office responsible for evaluation of transfer credits from community-junior colleges by circling the appropriate number.

   Admissions Office does all evaluation of both general education and technical courses..............................1

   Admissions Office does all evaluation of both general education and technical courses that can be easily evaluated--only problem cases are referred to you..2

   Admissions Office does evaluation of general education courses only.3

   Department evaluates technical courses...........................4

   Department evaluates all transfer credit.........................5

   Other (specify)   ..6

5. Please circle the appropriate number to indicate the total credits your institution will accept for transfer from community-junior colleges.

50% of the baccalaureate degree program..............................1

40-49% of the baccalaureate degree program...........................2

30-39% of the baccalaureate degree program...........................3

Other (specify) ..4

6. Please circle the appropriate number to indicate the total credits your department will accept toward your technical course requirements.

About 100% of the technical course requirements.....................1

About 75% of the technical course requirements......................2

About 50% of the technical course requirements......................3

About 25% of the technical course requirements......................4

7. Indicate the maximum number of semester hours of credit your department will accept in each of the following technical areas. (Note: The total of individual units below may exceed the total indicated in Item No. 6.)

Drafting...................... ______

Electricity-Electronics........ ______

General Industrial Arts (Shop). ______

Graphic Arts.................. ______

Metalworking.................. ______

Power-Automechanics........... ______

Woodworking................... ______

Industrial Crafts.............. ______

Other (specify) .. ______

8. Indicate the maximum amount of credit your department will accept in each specific technical area by circling the appropriate number.

Same amount as the total hours offered in your department. (For example, if your department offers eight (8) hours of Electricity-Electronics, eight (8) hours will be accepted from transfer students.)....................................1

Less than the total amount offered by your department..............2

Some more than the total amount offered by your department. (Additional credit is granted by utilizing special problem courses, seminar credit, etc.).....................................3

All technical credit taken by the student in a community-junior college regardless of amount....................4

Other (specify) ..5

9. Many community-junior colleges offer in-depth preparation in a highly specialized technical area (such as 20 or more hours of Machine Shop or Architectural Drafting). How much technical credit will you accept as transfer in a specific area such as Architectural Drafting or Machine Shop? Please circle the appropriate number.

Same as the total number of credits offered in this specialty by your department...................................1

Department counselor's judgment used to determine maximum credits offered...2

All of the technical credits in the specialized area...............3

Other (specify) ..4

10. Are the following types of courses taken at community-junior colleges but not part of an Associate Degree program evaluated for credit?

10a. Trade and industrial type programs such as those in Automechanics, Sheetmetal, etc.

Yes..........1 No..........2

If yes, what is the basis for credit (i.e. 100 contact hours equals one (1) semester hour)?

10b. Apprenticeship training courses.

Yes..........1 No..........2

If yes, what is the basis for credit (i.e. 100 contact hours equals one (1) semester hour)?

11. Is college credit given for previous work experience for students majoring in:

Industrial Arts	Yes..........1	No..........2
Technical Education	Yes..........1	No..........2
Trade and Industrial (Vocational)	Yes..........1	No..........2

12. If the answer is yes to the above question, how many semester hours of credit is the maximum given for work experience?

____

13. How is work experience evaluated for credit?

By interview (individual or committee)	Yes..........1	No..........2
By records and recommendations of employers	Yes..........1	No..........2
By testing (written and performance)	Yes..........1	No..........2
Other (specify)	Yes..........1	No..........2

14. How do you handle technical transfer credit in your department?

Immediate approval given for all courses that can be transferred..1

Delay of transfer credit until students have earned satisfactory course credit in your own department..................2

Other (specify) ..3

Effects of Transfer Students on Departmental Curriculum Planning

15. Indicate the approximate change in the mix of teaching majors in Industrial Education over the past five years in percentages.

	(%) Freshmen	(%) Transfer Students from Community-Junior Colleges	Others*	Total
1964-65				100%
1968-69				100%

*Transfers from other departments on campus, from other senior colleges, etc.

Note: The sum across each line should equal 100%

16. Has the growth in the number of transfer students from community-junior colleges affected the number of technical courses offered in your department?

Yes..........1 No..........2

If yes, specify how.

17. Indicate the change in the last five years in the number of lower level (freshmen and sophomore) technical courses offered by your department.

	Increased	Decreased	Same
Drafting...........................	1	2	3
Electricity-Electronics..............	1	2	3
General Industrial Arts (Shop)........	1	2	3
Graphic Arts........................	1	2	3
Metalworking........................	1	2	3
Power-Automechanics..................	1	2	3
Woodworking.........................	1	2	3
Industrial Crafts....................	1	2	3
Other (specify)	1	2	3

18. Has the growth in the number of transfer students from community-junior colleges affected the requirements for your major and minor?

Yes..........1 No..........2

If yes, specify how.

19. Please circle the appropriate number to indicate the total number of community-junior colleges that supply 75% of the transfer students to your department.

1 to 3..............1

4 to 6..............2

7 to 9..............3

10 or more..........4

Articulation of Courses and Programs

20. Circle the number indicating the total number of community-junior colleges your department works with actively in articulating their technical offerings with technical courses in your department.

1 to 3........................1

4 to 6........................2

7 to 9........................3

All community-junior
colleges in the state..........4

Other (specify) ..5

21. Circle the number indicating the kind of information your department supplies community-junior college counselors.

Specific course equivalency sheets showing all technical courses offered in the community-junior college and the equivalent courses in your department..............................1

If above is circled, please provide a sample.

A bulletin jointly prepared by the technical staff of the community-junior college and your department indicating courses that can be transferred....................................2

If above is circled, please provide a sample.

Other (specify) ..3

22. Does a staff member from your department visit each of the community-junior college technical departments before transfer courses are approved?

Yes..........1 No..........2

23. Check those factors that are considered in establishing quality creditability of technical courses in the community-junior colleges.

Your general knowledge of the community-junior college __________

Course outline used.... .... __________

Amount of laboratory time required.................. __________

Laboratory facilities at community-junior college..... __________

Qualifications of staff at community-junior college.. __________

Textbook used.............................. .... __________

Visit with the head of the technical department in the community-junior college. .... __________

24. Check those techniques that are used to evaluate technical competencies of the community-junior college transfer student.

None..____________

Course equivalents accepted at face value..........____________

Interview with individual student.................____________

Performance test..................................____________

Written non-standardized test.....................____________

Written standardized test.........................____________

Counseling and Recruiting of Transfer Students

25. Indicate which of the following methods are presently used to keep community-junior college counselors informed of opportunities in Teaching of Industrial Education.

Departmental staff visits community-junior colleges and talks to counselors and technical staff. Yes......1 No......2

Counselors from community-junior colleges are brought to campus for visit and orientation in your department. Yes......1 No......2

Descriptive folder of your department and opportunities in Industrial Education are sent to counselors. If yes, please send sample. Yes......1 No......2

Scholarship information relating to Industrial Education is regularly sent to counselors. Yes......1 No......2

Special audio-visual aids have been made available to counselors and to interest students in Industrial Education.

Posters	Yes....1	No....2
Filmstrip and tape	Yes....1	No ...2
Slide and tape	Yes....1	No....2
Other (specify)	Yes....1	No....2

General college catalog contains information that describes in a general way the opportunity to transfer technical credit from community-junior colleges to your program.	Yes......1	No......2
General college catalog describes specific course equivalents for each technical course offered in your department.	Yes......1	No......2
Specific equivalency sheets showing your departmental requirements and the community-junior college courses that meet these requirements are provided to counselors.	Yes......1	No......2

26. Indicate the methods presently used to help high school counselors to be kept informed on the articulation of technical courses in their area community-junior college with the technical courses in your department.

Descriptive material concerning curriculum in Industrial Education is supplied to all high school counselors in your state.	Yes......1	No......2

Descriptive material showing equivalency courses that students can take at the community-junior colleges are supplied to high school counselors. Yes......1 No......2

High school counselors are regularly invited to your department so it can be explained to them the opportunities in an articulated program between the community-junior college in their area and the program in your department. Yes......1 No......2

27. Please indicate the major problems you are now facing with transfer students from community-junior colleges.

Students come with too much concentration of credit in one technical area..........................__________

Difficult to evaluate the quality of the work taken by transfer students in community-junior colleges......................................__________

No way of accurately evaluating the competencies of transfer students from community-junior colleges......................................__________

Difficult to plan a teacher education program with only the last two years under control of our department..__________

Transfer students from community-junior colleges lose a large amount of credit in transferring to Industrial Education programs.......................__________

Courses taken by students in community-junior colleges do not match the courses offered by our department...__________

Others (Please comment on any other major problems that have developed in working with community-junior college transfer students.

28. Check the methods by which you believe better articulation can be developed between technical courses in your department and similar courses at the community-junior college level.

Using same course numbers....................................1

Using same course descriptions...............................2

Developing a joint uniform course outline....................3

Sending textbook lists and course of study for each of your courses to the technical department of the community-junior college.........4

Providing in-service institutes for technical teachers in the community-junior colleges, i.e. having all metalworking teachers from all community-junior colleges in for a short-term institute....5

Other (specify) ..6

Opinions on Issues Involved in Community-Junior College Transfer Students

The following questions concerning a number of important issues are involved in preparing an adequate supply of Industrial Education teachers. Please indicate your opinion of these practices.

29. The shortage of adequate staff in Industrial Education has raised the issue of the possibility of two-year teacher associates (aides).

Would you be in favor of a two-year, community-junior college curriculum for teacher aides in Industrial Education?	Yes......1	No......2
If yes, could this same program be used as the first two years of preparation for a baccalaureate degree in Industrial Education in your department?	Yes.....1	No......2
Should your department help in establishing a pre-teacher Industrial Education curriculum in the community-junior college?	Yes......1	No......2
Comment	Yes......1	No......2

30. Should special meetings at community-junior colleges be conducted which are led by members of your staff for all students who might become interested in industrial teaching?

Yes..........1   No..........2

31. Should cooperative courses between the senior college and the community-junior colleges (which are within a feasible distance) be held in which junior college students enrolled in certain courses are bussed to the senior college where better facilities and staff are available?

Yes..........1   No..........2

32. Technical courses in the community-junior college generally are designed for preparing two-year technicians. With this in mind, please answer the following:

32a. Are technical courses offered in the community-junior college adequate for:

The junior high school general industrial arts teacher.	Yes......1	No......2
Senior high school specialist industrial arts teacher.	Yes......1	No......2
The vocational-industrial teacher.	Yes......1	No......2
The technical education teacher.	Yes......1	No......2

32b. Should the following types of technical courses be accepted for credit toward a teaching major in Industrial Education?

Data processing	Yes......1	No......2
Descriptive geometry	Yes......1	No......2
Manufacturing processes	Yes......1	No......2
Metallurgy	Yes......1	No......2
Quality Control	Yes......1	No......2

32c. Indicate whether you believe the following to be strengths or weaknesses of technical courses offered in community-junior colleges as preparation for a teaching major in Industrial Education.

	Strength	Weakness
Less emphasis on project making	________	________
More lecture and less lab work	________	________
Some courses taught by engineers	________	________
Others (specify)	________	________

33. Assuming that the majority of students enrolled in Teaching of Industrial Education curriculum in the years ahead will be transfer students from community-junior colleges in your state, what practices do you believe should be established immediately to provide for better articulation between the two institutions.

A pre-teacher Industrial Education curriculum should be established in every community-junior college in the state.	Yes......1	No......2
A pre-teacher curriculum should be established in selected community-junior colleges in your state.	Yes......1	No......2
Certain special technical courses should be developed in the community-junior colleges for prospective Industrial Education teachers.	Yes......1	No......2
Certain special professional orientation courses for prospective Industrial Education teachers should be developed in the community-junior college.	Yes......1	No......2
Credit courses for cooperative work experience should be developed in the community-junior colleges.	Yes......1	No......2
Other (specify)	Yes......1	No......2

34. Assuming that the majority enrolled in the Teaching of Industrial Education curriculum in your state will in the years ahead be transfer students from community-junior colleges, what effect will this have on the kind and supply of teachers?

34a. Fewer General Industrial Arts (Shop) teachers will be produced.

Yes..........1 No..........2

34b. Number of specialized industrial teachers will change as follows. Circle appropriate number.

	Increase	Decrease	Same
Drafting............................	1	2	3
Industrial Crafts and Synthetics.....	1	2	3
Electricity-Electronics..............	1	2	3
General Industrial Arts (Shop).......	1	2	3
Graphic Arts.........................	1	2	3
Metalworking.........................	1	2	3
Power-Automechanics..................	1	2	3
Woodworking..........................	1	2	3
Other (specify)......................	1	2	3

35. Recognizing that the vocational teacher needs occupational experience to meet the requirements of most of the State Plans, which of the following would best increase the supply of vocational-industrial teachers in your state? (Rate in order of preference)

An articulated five or six-year program (community-junior and senior college cooperating) with intermittent summer work experience and coordinated credit work experience to complete the baccalaureate degree along with the necessary work experience for state certification. ___________

A plan for identifying outstanding two-year, community-junior college technical programs. The names of their graduates along with the positions they have accepted would be sent to teacher education departments or a state department agency. A follow-up of these technicians after the necessary work experience interval would be made to interest these individuals in returning to college to complete the baccalaureate degree for vocational-industrial teacher education. ___________

A plan whereby the senior college would offer evening technical courses in the community-junior college for technicians in industry. During this course, an attempt would be made to interest them in vocational-technical teaching. ___________

A plan involving the senior college offering professional courses such as training methods or safety for technicians in vocational-technical teaching. ___________

Other (comment) ___________

36. Recognizing the fact that much of the related apprenticeship training is now a responsibility of the community-junior college,

Outstanding apprenticeship graduates should be encouraged to become interested in vocational-industrial teaching as a career.	Yes......1	No......2
College credit should be allowed for practical experience taken in the apprenticeship.	Yes......1	No......2
College credit should be allowed for the related instruction taken in the apprenticeship.	Yes......1	No......2
Other (comment)	Yes......1	No......2

37. Assuming that a pre-teacher curriculum for industrial teachers could be established, fill the chart below to indicate what you believe should be the division of responsibility between the two institutions.

	Community-Junior College %	Senior College %	Total %
General or Liberal Educ.			35%
Technical Course			35%
Professional Courses in Ind. Educ.			10%
Educ. Courses Including Student Teaching			20%
TOTAL			100%

38. Additional questions or comments.

A STUDY OF
A
PRE-INDUSTRIAL TEACHER CURRICULUM
FOR
COMMUNITY-JUNIOR COLLEGES

Conducted By:

Industrial Education Department
Western Michigan University
Kalamazoo, Michigan 49001

Careers In Industrial Education

Admissions Office Survey

WESTERN MICHIGAN UNIVERSITY

DEVELOPMENT OF JUNIOR/COMMUNITY COLLEGE CURRICULA
FOR FUTURE TEACHERS OF INDUSTRIAL EDUCATION

KALAMAZOO, MICHIGAN
49001

USOE Sponsored Project # 7-0074
Grant # OEG-0-8-070074-3713 (085)

Investigators:
Dr. John L. Feirer
Dr. John R. Lindbeck

States Included
California, New York, Texas,
Illinois, Michigan, and Florida

Dear Admissions Officer:

Yours is one of the six states in which the rapid growth of community-junior colleges is having a great impact on teacher education programs. We are sure that you share with us the concern for developing better articulation between the work offered in the community-junior colleges and the preparation needed for good teachers . This study is particularly concerned with the preparation of industrial, vocational, and technical teachers. Since your institution has a department of industrial teacher preparation, we need your cooperation in securing information about present practices. We are attempting to develop a pre-industrial education teacher curriculum for the community-junior colleges. The study is sponsored by funds from the U.S. Office of Education. The final report, which will be available to all who are interested, will contain conclusions and recommendations based on your responses and the results of a work-study conference which will be held on our Campus in May of 1969.

This study is going out to all of the admission officers in all the senior institutions in the six states involved in this study. The accuracy of our findings will depend on the cooperation of everyone who has been invited to participate. We are well aware that you are frequently asked to respond to surveys and that the task oftentimes seems burdensome. However, since this study will have an impact on your day-to-day job in the years ahead; we hope that you will be interested in it. We welcome any additional comments you may have about the study and hope that the final report will be as valuable to you as your cooperation is to us.

Thank you for your help,

John L. Feirer
Study Director

jat

ADMISSIONS OFFICE QUESTIONNAIRE

Your name____

Name of institution____

Street or post office address_________________________________

City____________________County___________State_________Zip______

1. Total enrollment in institution:

   ____

2. Approximate percentage of community-junior college transfer students in institution:

   ____

3. Arrange in decending (1,2,3,4) order when most students transfer from community-junior colleges to your institution.

   End of one year................ ______
   End of one and one-half years.. ______
   End of two years............... ______

4. Total majors in Teaching of Industrial Education (Industrial Arts, Vocational-Industrial, and Technical):

   ____

5. Approximate percentage of community-junior college transfer students in Industrial Education:

   ____

6. Indicate by circling the correct number your basic policy concerning admission of students.

   Preference given to community-junior college transfer students within your state..1

   Preference given to entering freshmen within your state..2

   No preference between either of the above groups..3

   Other (specify): 4

7. Indicate the individual or office responsible for **evaluation** of transfer credits from community-junior colleges by circling the appropriate number.

Admissions Office does all evaluation of both general education and technical courses........................1

Admissions Offices does all evaluation of both general education and technical courses that can be easily evaluated--only problem cases are referred to Industrial Education Department..2

Admissions Office does evaluation of general education courses only..................................3

Industrial Education Department evaluates technical courses..4

Industrial Education Department evaluates all transfer credit.......................................5

Other (specify): 6

8. Circle the approximate number to indicate the total credits your institution will accept for transfer from community-junior colleges toward a degree program.

50% of the baccalaureate degree program..........................1

40-49% of the baccalaureate degree program........................2

30-39% of the baccalaureate degree program........................3

Other (specify) 4

9. Indicate the average grade on a four-point standard (A=4, B=3, C=2, and D=1) required for admission. Please circle.

Freshmen	Community-Junior College Transfer Students
3+	3+
3	3
3-	3-
2+	2+
2	2
2-	2-

10. Is transfer credit given for courses in which a "D" has been earned? Please circle.

Yes..........1   No..........2

11. Are the following types of courses that are taken at community-junior colleges but are not a part of an Associate Degree program evaluated for credit. Please circle.

11a. Trade and industrial type programs such as those in Automechanics, Sheetmetal, etc.

Yes..........1   No..........2

11b. Apprenticeship training courses.

Yes..........1   No..........2

12. Check the information your institution supplies to community-junior college counselors and advisers.

Specific course equivalency information for all general education courses.................................______

If above is checked, please provide a sample.

Specific course equivalency sheets showing technical courses offered in the community-junior college and equivalent courses in your Industrial Education Department..........................______

If above is checked, please provide a sample.

A bulletin jointly prepared by the community-junior colleges and the Industrial Education Department indicating courses which can be transferred..______

If above is checked, please provide a sample.

13. Must equivalency sheets for technical courses prepared by the Industrial Education Department be approved by the Admissions Office? Please circle.

Yes..........1   No..........2

14. Check those factors your office uses in establishing quality creditability of technical courses in community-junior colleges.

Course description in community-junior college catalog..______

Your general knowledge of the community-junior college..______

Course outline used..______

Qualifications of staff at community-junior college..______

Visit with the technical department in the community-junior college..______

15. Check those techniques that are used to evaluate technical courses of the community-junior college transfer student.

None..______

Course equivalents accepted at face value..______

Interview with individual student..______

Performance test..______

Written non-standardized test..______

Written standardized test..______

16. Indicate which of the following methods are presently used to keep community-junior college counselors informed of opportunities in specialized teaching areas such as Teaching of Industrial Education. Please circle.

Admissions Office staff only visits community-junior colleges and talks to counselors and technical staff..Yes...1 No...2

Admissions Office staff with members from the specialized department visits community-junior colleges and talks to counselors and staff..Yes...1 No...2

(No. 16 is continued on the following page.)

Counselors from community-junior colleges are brought to campus for visit and orientation to specialized departments.............Yes...1   No...2

Descriptive folders of specialized departments are sent to counselors.................Yes...1   No...2

If yes is circled above, please provide sample.

General college catalog describes specific course equivalency for general education courses...Yes...1   No...2

General college catalog contains information which describes in a general way the opportunities to transfer technical credits from community-junior colleges to your institution.......................................Yes...1   No...2

General college catalog describes specific course equivalencies for technical courses offered in Industrial Education Department.........Yes...1   No...2

Specific equivalency sheets showing Industrial Education Department requirements and community-junior colleges courses that meet those requirements are provided to community-junior college counselors.............Yes...1   No...2

17. Please indicate the major problems you are now facing with transfer students from community-junior colleges who wish to become Industrial Education teachers. Please check.

Students come with too much concentration of credit in one technical area............................______

Difficult to evaluate the quality of the work taken by transfer students in community-junior colleges..................................______

No way of accurately evaluating the technical competencies of transfer students from community-junior colleges.............................______

(No. 17 is continued on the following page.)

Difficult to plan a teacher education program with only the last two years under control of our institution.................................______

Transfer students from community-junior colleges lose a large amount of credit in transferring to Industrial Education programs..............______

Courses taken by students in community-junior colleges do not match the courses offered by Industrial Education Department.................______

Others: (Please comment on any other major problems which have developed in working with community-junior college transfer students.)

18. Check the methods by which you believe better articulation can be developed between technical courses in the Industrial Education Department and similar courses at the community-junior college level.

Using same course numbers...1

Using same course descriptions....................................2

Developing uniform course outline.................................3

Revising your institution's catalog to make it more useful to community-junior college counselors...4

19. Additional comments:

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Counselor Questionnaire

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FOR FUTURE TEACHERS OF INDUSTRIAL EDUCATION

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States Included
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Illinois, Michigan, and Florida

Dear Counselor:

Yours is one of the states in which the rapid growth of community-junior colleges is having a great impact on the preparation of industrial, technical, and vocational teachers. We are sure that you share with us the concern for developing better articulation between the technical work offered in the community-junior college and the preparation needed for good industrial education teachers. Therefore, we are inviting you to participate in a study of this problem, a project supported by funds from the U.S. Office of Education. A copy of this project proposal is in the hands of the Technical Division Dean at your college. The final report will contain conclusions and recommendations based on your responses and on the results of a work-study conference that will be held on our Campus in May of 1969.

This survey is being disseminated to the community college counselors in the participant states. The data collected will help us to attend to the problem as seen by the counseling staff. We know you are frequently asked to respond to surveys and that the task oftentimes seems burdensome. However, since this study will have implications for the years ahead, we hope that you will be interested in it. We welcome any additional comments you may have about the study and hope that the final report will be as valuable to you as your cooperation is to us.

Thank you for your help,

John R. Lindbeck

John R. Lindbeck
Study Director

jat

COUNSELOR QUESTIONNAIRE

Your name____

Name of institution________________________________

Street or post office address________________________

City________________County________________State______________Zip____

YES NO

___ ___ 1. Have you been supplied with industrial-technical teacher education guidance information or curriculum materials from any of the colleges or universities in your state?

___ ___ 2. Have you ever met with representatives of college or university industrial education departments to discuss transfer or articulation problems?

___ ___ 3. Have you prepared or been supplied with industrial education course equivalency information? (See attached sample.)

___ ___ 4. Do you understand the differences between industrial arts, vocational education, and technical education?

5. Check the industrial education information you would like to have in your counseling file.

____ a. Course equivalency sheets

____ b. Curriculum descriptions and course requirement sheets

____ c. Occupational information

____ d. Statistics on demands for teachers

____ e. Guidance filmstrips or tapes for student use

____ f. Information sheet on universities offering degree work in teacher education

____ g. Scholarship information

____ h. Other (specify)

6. Check the kinds of assistance (from industrial education departments) you would find most helpful in your counseling work.

____ a. Inspection and evaluation of community college courses

____ b. Community college--university liaison

____ c. Better understanding of each other's goals

____ d. Visitations to discuss career information with students

____ e. Student visitations to industrial education departments

____ f. Other (specify)

SAMPLE

WESTERN MICHIGAN UNIVERSITY
INDUSTRIAL EDUCATION EQUIVALENTS

W.M.U. COURSES			MUSKEGON COUNTY COMMUNITY COLLEGE	
I.E. Area	Course	Sem. Hrs.	Course	Sem Hrs
DRAWING	120 Survey of Drafting	3	Draft. 100 - Intro. of Graphic Representation	3
	226 Industrial Graphics	3	Draft. 101 - Ele. of Ind. Draft.	3
	227 Technical Sketching	3		
	231 Descriptive Geo.	3	Draft. 201 - Geometry of Drafting	3
	326 Adv. Indus. Graphics	3		
	330 Machine Drafting	3	Draft. 102 - Ele. of Machine Draft.	3

WESTERN MICHIGAN UNIVERSITY

**DEVELOPMENT OF JUNIOR/COMMUNITY COLLEGE CURRICULA
FOR FUTURE TEACHERS OF INDUSTRIAL EDUCATION**

KALAMAZOO, MICHIGAN
49001

USOE Sponsored Project # 7-0074
Grant # OEG-0-8-070074-3713 (085)

Investigators:
Dr. John L. Feirer
Dr. John R. Lindbeck

States Included
California, New York, Texas,
Illinois, Michigan, and Florida

Dear Teacher Educator:

We have appreciated your cooperation in this community-junior college research study, and we are asking once again for your assistance in gathering additional data. We wish you to distribute the enclosed survey forms to twenty of your community-junior college transfer students in Industrial Education and request that they fill them in as best they can. When completed, would you kindly collect the questionnaires and return them to us in the enclosed envelope.

Thank you, and we appreciate your assistance.

Sincerely,

John R. Lindbeck
(jat)

John R. Lindbeck
Study Director

WESTERN MICHIGAN UNIVERSITY

DEVELOPMENT OF JUNIOR/COMMUNITY COLLEGE CURRICULA
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Investigators:
Dr. John L. Feirer
Dr. John R. Lindbeck

States Included
California, New York, Texas,
Illinois, Michigan, and Florida

Dear Transfer Student:

The following questionnaire may look both long and formidable, but it goes quickly. Its concern is primarily with an action program of extreme importance to you as a prospective industrial teacher.

Yours is one of the states in which the rapid growth of community-junior colleges is having a great impact on the preparation of industrial, vocational, and technical teachers. We are sure that you share with us the concern for developing better articulation between the technical work offered in the community-junior college and the preparation needed for good industrial education teachers. Therefore, we planned this six-state study to develop a pre-industrial education teacher curriculum for community-junior colleges. This study is supported by funds from the U.S. Office of Education. The final report, which will be available to all who are interested, will contain conclusions and recommendations based on your responses and on the results of a work-study conference which will be held on our Campus in May of 1969.

This survey is going out to selected students who are transfers from community-junior colleges. Its purpose is to identify the kinds of problems students have experienced in the move from the junior to the senior college. The ultimate aim, obviously, is to provide guidelines which will serve to overcome these problems. Please answer these questions as accurately as possible. We welcome any additional comments you may have and hope that the final report will be a valuable document in planning quality industrial teacher programs.

Thank you for your help,

John R. Lindbeck (jat)

John R. Lindbeck
Study Director

jat

TRANSFER STUDENTS IN INDUSTRIAL-TECHNICAL TEACHER EDUCATION

1. Father's occupation: ____________________

2. What type of high school did you attend? Circle appropriate number.

General..1
Technical..2
Vocational...3

3. What community-junior college did you attend? ____________________

4. What senior institution are you now attending? ____________________

5. What was your high school curriculum? Circle appropriate number.

College preparatory..................................1
General curriculum...................................2
Vocational or Technical..............................3
Other (specify): 4

6. Why did you take high school Industrial Arts courses: Circle appropriate number.

Required...1
Interest in course...................................2
Lack of interest in other courses....................3
Suggestion from counselor............................4
Influence of teacher.................................5
Influence of someone else. (specify): 6

7. How important were the following in influencing your choice of an industrial teaching career? (Please check.)

	Very Important	Somewhat Important	Slightly Important	Not Important
High school counselor				
High school teacher				
Com.-jr. college counselor				
Com.-jr. college teacher				
Parents				
Other adult (specify who):				
Friends				
Reading				
Courses (specify):				
Work experience				
Other (specify):				

8. Which of the following influenced you to come to your present institution rather than some other? (Please check.)

	Most Important	Second Importance	Of Some Importance	Not Important
High school counselor				
High school teacher or principal				
Com.-jr. college counselor				
Com.-jr. college teacher in your field				
Other com.-jr. college teacher				
Parents				
Other relative				
Friends				
College recruiter				
Program offerings or publications				
Location				
Cost				
Reputation of university in your field				
Facilities and equipment				
Other (specify):				

9. Check the high school Industrial Arts courses you had in Column I. In Column II, check those courses you particularly liked or which stimulated you to take additional work in the area. In Column III, check the area of specialization you pursued in the community-junior college.

	Column I	Column II	Column III
Drafting............................			
Woodworking.........................			
Metals/Machine Tool.................			
General Shop........................			
Electricity-Electronics.............			
Power or Automotives................			
Crafts (including Plastics).........			
Graphic Arts........................			
Engineering.........................			
Other (specify):			

10. Was there a gap in time: (Please check.)

A. Between high school and starting community-junior college? Yes______ No______

If yes is checked above, were you:

Working ______
In armed services ______

B. Between community-junior college and starting senior college? Yes______ No______

If yes is checked above, were you:

Working ______
In armed services ______

11. Check those statements which are true of the counselors in each school.

	High School	Com.-Jr. College	Senior College
Counselor understood industrial field and was able to give good advice.			
Counselor took a personal interest in me.			
Counselor understood my interests and abilities.			
Counselor understood offerings of community junior and senior college and was able to help in setting up my program.			

12. Which of these suggestions appeals to you as helpful for students who may become interested in the Teaching of Industrial Education. Please circle appropriate number.

Better understanding of the field by the high school counselor.....1

Help from the junior college counselor in discussing the field and its opportunities.....................................2

Help from the junior college counselor in setting up a course of study articulated with the senior college program........3

Community-junior college laboratory course specifically for those students intending to teach.................4

Special meetings or workshops for junior college freshmen led by faculty from senior college to discuss openings in field and requirements for transfer..................................5

Visits to neighboring senior college during freshmen year..........6

Literature from senior colleges to high school and junior college counselors giving details of programs...................7

Efforts to improve the image of Industrial Education with parents, teachers, and students in other fields...................8

13. What problems did you have in transferring from the community-junior college to the senior college? Circle appropriate numbers.

Need to repeat courses in which a
grade below "C" was received....................................1

Loss of academic credits from community-junior college.............2

Loss of technical credits from community-junior college............3

How many credits were lost? __________

Delay in graduation because of having to take additional
basic courses...4

Differences in course content making
more advanced work more difficult...............................5

Differences in teaching methods.................................6

Not knowing how to study for senior college courses...............7

Personal financial problems because of:

Greater cost..8a
Not being able to work enough hours and time for study........8b
Scarcity of jobs paying enough for needs.......................8c

14. If you had or have problems with English or Math courses, please check appropriate.

	English	Math
High school		
Community-junior college		
Senior college		

15. Have you changed your field of specialization? Circle appropriate number.

No..1
Between high school and community-junior college................2
First year of community-junior college..........................3
Second year of community-junior college.........................4
Between community-junior and senior college.....................5

16. If you changed fields, how may credits did you lose? ______________

17. How many credits did you earn at the community-junior college?______

18. Did you apply to senior institutions other than the one you are now attending?

Yes..........1 No..........2

If yes is circled above, what differences were there in the number of credits that would be accepted from your junior college work?

19. What area of specialization did you pursue in the community-junior college? Circle appropriate number.

Drafting and Design..1
Machine Tool...2
Electricity-Electronics....................................3
Graphic Arts...4
Mechanical...5
Engineering..6
Automotive-Power...7
Other (specify): 8

20a. When did you decide on your present area of specialization? Circle appropriate number in Column I.

20b. When did you decide on a teaching career? Circle appropriate number in Column II.

	Column I	Column II
Junior high school..................................	1	1
High school...	2	2
Between high school and community-junior college....	3	3
Community-junior college............................	4	4
Between community-junior college and sr. college....	5	5
Senior college......................................	6	6

ADDITIONAL COMMENTS:

A STUDY OF
A
PRE-INDUSTRIAL TEACHER CURRICULUM
FOR
COMMUNITY-JUNIOR COLLEGES

Conducted By:

Industrial Education Department
Western Michigan University
Kalamazoo, Michigan 49001

Careers In Industrial Education

Professional Preparation Survey
Community College Technical Division Faculty

WESTERN MICHIGAN UNIVERSITY

DEVELOPMENT OF JUNIOR/COMMUNITY COLLEGE CURRICULA
FOR FUTURE TEACHERS OF INDUSTRIAL EDUCATION

KALAMAZOO, MICHIGAN
49001

USOE Sponsored Project # 7-0074
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Investigators:
Dr. John L. Feirer
Dr. John R. Lindbeck

States Included
California, New York, Texas,
Illinois, Michigan, and Florida

Dear Technical Division Dean:

Yours is one of the states in which the rapid growth of community-junior colleges is having a great impact on the preparation of industrial, technical, and vocational teachers. We are sure that you share with us the concern for developing better articulation between the technical work offered in the community-junior college and the preparation needed for good industrial education teachers. Therefore, we are inviting you to participate in a study supported by funds from the U.S. Office of Education, a copy of which is enclosed for your information. The final report will contain conclusions and recommendations based on your responses and on the results of a work-study conference that will be held on our Campus in May of 1969.

This survey is being disseminated to the deans of technical divisions of community colleges in the six participant states. The resultant data collected will aid in preparing a profile of the technical teacher in the community college. We know you are frequently asked to respond to surveys and that the task oftentimes seems burdensome. However, since this study will have implications for the years ahead, we hope that you will be interested in it. We welcome any additional comments you may have about the study and hope that the final report will be as valuable to you as your cooperation is to us.

Thank you for your help.

John R. Lindbeck

John R. Lindbeck
Study Director

jat

PROFESSIONAL PREPARATION SURVEY
COMMUNITY COLLEGE TECHNICAL DIVISION FACULTY

Your name ____________________ Name of institution ____________________

Street or post office address ____________________

City ____________ County ____________ State ____________ Zip ____________

(Please use additional sheets if necessary.)

Position	Undergraduate		Graduate		Yrs. Experience		Other Qualifications (Voc. Certificate, Regd. Architect, etc.
	Degree	Field	Degree	Field	Tchng. (Total)	Indus.	
Example: Drafting	B.S.	Indus. Arts	M.A.	Indus. Educ.	5	2	Voc. Certificate

PARTNERS

TNERS IN INDUSTRIAL-TECHNICAL TEACHER EDUCATION/THE COOPERATIVE ROLES OF THE COMMUNITY-JUNIOR [illegible]

PARTNERS IN INDUSTRIAL-TECHNICAL TEACHER EDUCATION

THE COOPERATIVE ROLES OF THE COMMUNITY-JUNIOR COLLEGES AND THE SENIOR INSTITUTIONS

This is a summary of the research study titled "Development of Junior/Community College Curricula for Future Teachers of Industrial Education," USOE Sponsored Project #7-0074, Grant #OEG-0-8-070074-3713 (085).

Individuals interested in related research, survey forms used, statistical details by states, and a complete report on the Work-Study Conference may secure a copy of the complete report through ERIC when it becomes available after July, 1970.

The contents of this bulletin are based upon:
Five surveys sent to professionals in the six states as follows:
IE department heads in SI
Admission offices in SI
Transfer students in IE programs in SI
Counselors in C-JC
Deans of technical studies in C-JC

All statistics (percentages) cited pertaining to the surveys are based upon the actual number of surveys returned.

The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

A work-study conference was held on the campus of Western Michigan University in May of 1969 with representation as follows:

Directors
John Feirer, John Lindbeck

California
James Allison, Melvin Barlow, Ralph Bohn

Florida
Ernest Heiny, George Mehallis, Hobdy Perkins, Richard Ray, Ralph Steeb

Illinois
Jerry Dobrovolny, Charles Hill, Charles Porter, Bernard Quigley

Michigan
Arthur Francis, Bruce Kocher, Cameron Lambe, Frederick Whims

New York
John Briscoe, Robert Buxton, Justice Cheney

Texas
Everett Glazener, Joseph Godsey, Truman Isbell

Others
Rolf Anselm, Lewis Fibel, Sidney Fine, Sidney High, William Lewis, Lewis Nicolini, Allen Raymond, E. Earl Wright

Art Direction/Linda Paauwe

Design Consultant/John Carney

Photography/Peter Miehm

Secretary/Judith Triemstra

Project Officer/John Bean

University Press/Larry Brink

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Focus on the Problem
Curriculum
Articulation
Staff and Facilities
Guidance and Counseling
Student Transfers and Admissions
Résumé

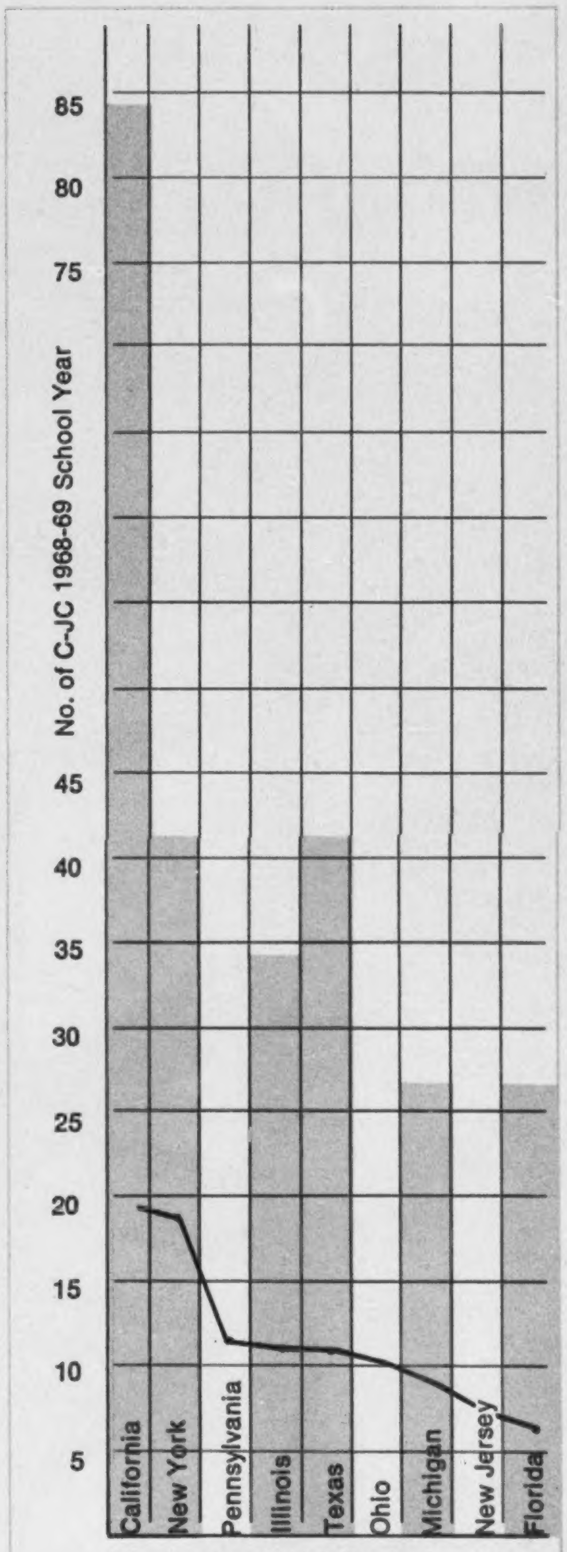
Abbreviations and Terms

SI	senior institution(s)
C-JC	community-junior college(s)
IE	industrial education
A.A.S.	Associate of Applied Science
Partnership	A planned, cooperative program between the C-JC and SI with a structured pre-industrial teacher curriculum at the C-JC.
Pyramid	A planned program for building a four-year program on a completed two-year A.A.S. program in the C-JC.
PAP Programs	Partnership and Pyramid Programs for industrial teacher education

The major purpose of this bulletin is to present guidelines developed for improving the quality and quantity of IE teachers. The focal points will center around two prime modes of attack:

Facilitating the transfer of students from C-JC who have completed a two-year vocational-industrial or technology program. An integral part of such a scheme is to commit IE departments in SI to two things; namely, to accept such students with a minimal loss of transfer credit and to build the remaining two years of their program in such a manner that each transfer student emerges as a qualified IE teacher/

Examining the possibilities of establishing a pre-industrial teacher curriculum in the C-JC. Articulating such curricula will require close coordination between the C-JC and SI in order to guard against any infringement upon the purposes and missions of either institution/



Nine largest States Ranked by Estimated Population, 1968-69 (Millions of Persons) ——

focus on the problem

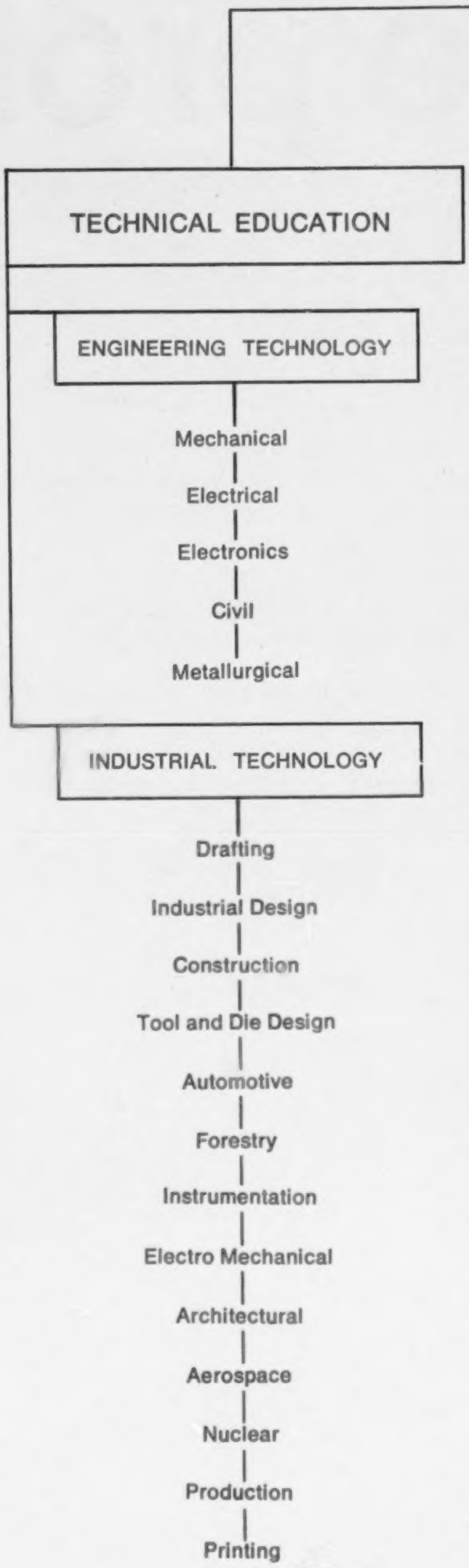
Industry and technology have major influences on the American culture. Education's central roles are to transmit our cultural heritage and to prepare young people to live in this technological society. The area of education related to industry and technology is IE.

Industrial education consists of industrial arts, vocational-industrial education and technical education. Each of these specialized areas is concerned with unique social and economic problems of large segments of the total population.

The essential element in successful IE programs is the teacher, and the nation is experiencing an acute shortage of qualified instructors in IE.

6 Industrial education is a generic term which broadly defines that part of the total education program which includes instruction in technical education, industrial arts, and vocational-industrial education. Occupational programs in business, distributive, health, agriculture, home economics and many other areas are not included in this study.

Technical education is concerned with programs to prepare technicians. Technicians work on teams with engineers, scientists, supervisors, and skilled craftsmen converting theories and ideas into products and processes. There are two main types of technicians of concern in this bulletin; namely, the engineering technician and the industrial technician. "Engineering technology is that part of the engineering field which requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational area between the craftsman and the engineer, at the end of the area closest to the engineer." (American Society for Engineering Education) The industrial technician exhibits similar competencies within a narrower range of industry, such as drafting, instrumentation, automotive, printing, etc. Technical programs are normally offered in technical institutes and/or C-JC.


TECHNICAL EDUCATION
ENGINEERING TECHNOLOGY
Mechanical
Electrical
Electronics
Civil
Metallurgical
INDUSTRIAL TECHNOLOGY
Drafting
Industrial Design
Construction
Tool and Die Design
Automotive
Forestry
Instrumentation
Electro Mechanical
Architectural
Aerospace
Nuclear
Production
Printing

Industrial arts is the study of industry and technology including its tools, materials, products, processes, and occupations. It is the body of related subject matter, or related courses, organized for the development of understanding about the technical, consumer, occupational, recreational, organizational, managerial, social, historical, and cultural aspects of industry and technology. Learning experiences involve activities such as experimenting, designing, constructing, evaluating, and using tools, machines, materials, and processes which provide opportunities for creativity and problem solving.
The unique goals of industrial arts are:
To develop an insight and understanding of industry and its place in our culture/
To discover and develop talents, aptitudes, interests, and potentials of individuals for technical pursuits and applied science/
To develop an understanding of industrial processes and practical application of scientific principles/
To develop basic skills in the proper use of common industrial tools, machines, and processes/
To develop problem-solving and creative abilities involving the materials, processes, and products of industry/

Programs may be at levels from K-12, although most specialized classes are offered at the junior and senior high school levels.

INDUSTRIAL EDUCATION

INDUSTRIAL ARTS

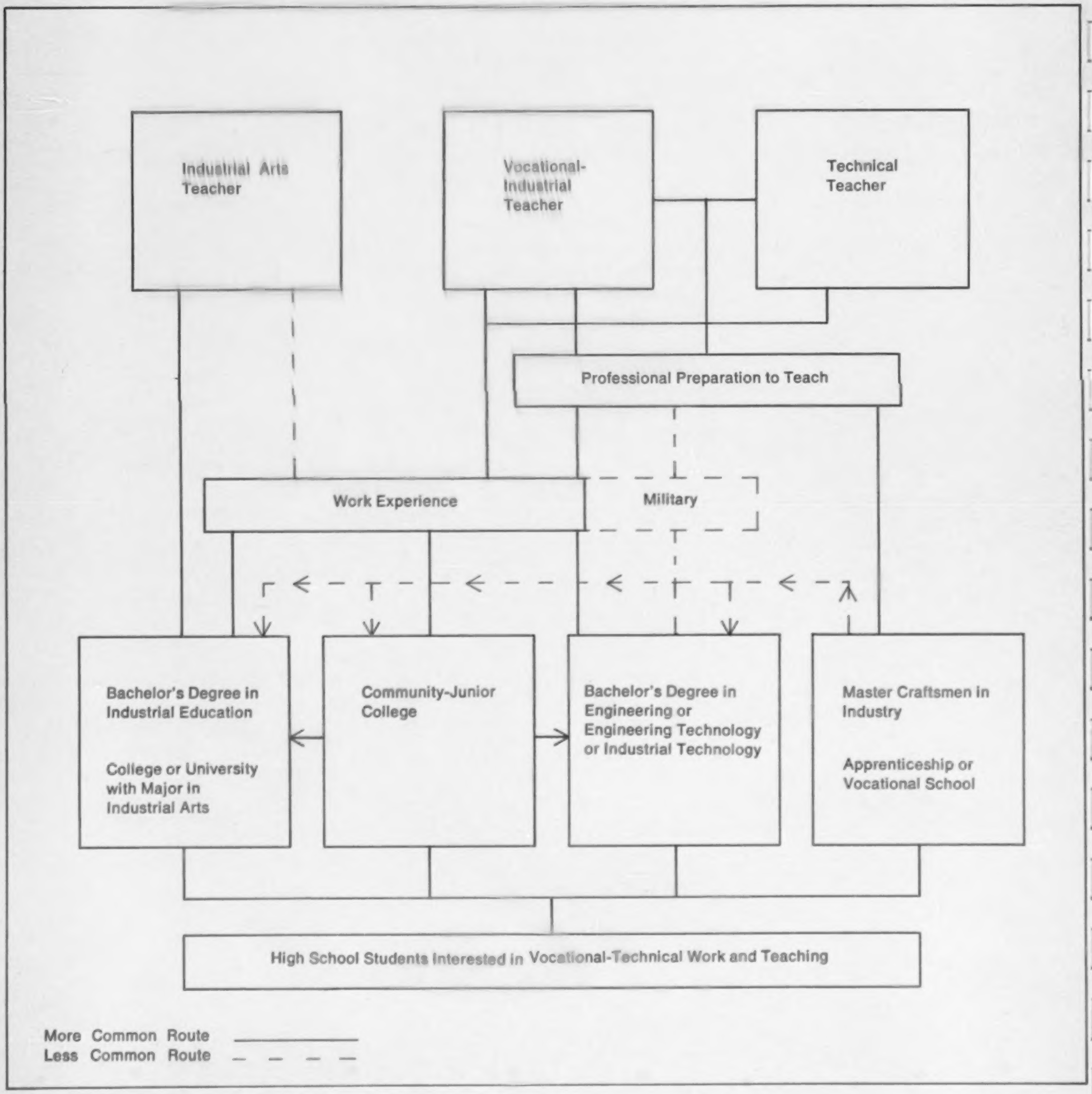
- Electricity-Electronics
- General Woodworking
- General Metals
- Power Mechanics
- Graphic Arts
- Industrial Crafts
- General Drawing
- General Industrial Arts
- Construction
- Manufacturing
- Energy and Power
- Communications
- Material Processes
- Research and Development

Vocational-industrial education, or trade and industrial, is a branch of vocational education which is concerned with preparing people for initial employment or for upgrading or retraining workers in a wide range of trades and industrial occupations. Such occupations involve planning, designing, producing, building, processing, assembling, testing, maintaining, servicing, or repairing any product or commodity. Instruction is provided in basic manipulative skills, safety, and related occupational information in mathematics, drafting, and science required to perform successfully. Programs may be at the secondary or post-secondary levels.

VOCATIONAL-INDUSTRIAL EDUCATION

- Carpentry
- Machine Shop
- Appliance Repair
- Auto Mechanics
- Auto Body Repair
- Bricklaying
- Cabinetmaking
- Diesel Mechanics
- Electrical Wiring
- Industrial Electricity
- Upholstery
- Gas Engine Repair
- Plumbing
- Printing
- Radio and TV Service
- Refrigeration and Air Conditioning
- Sheet Metal Work
- Welding
- Drafting

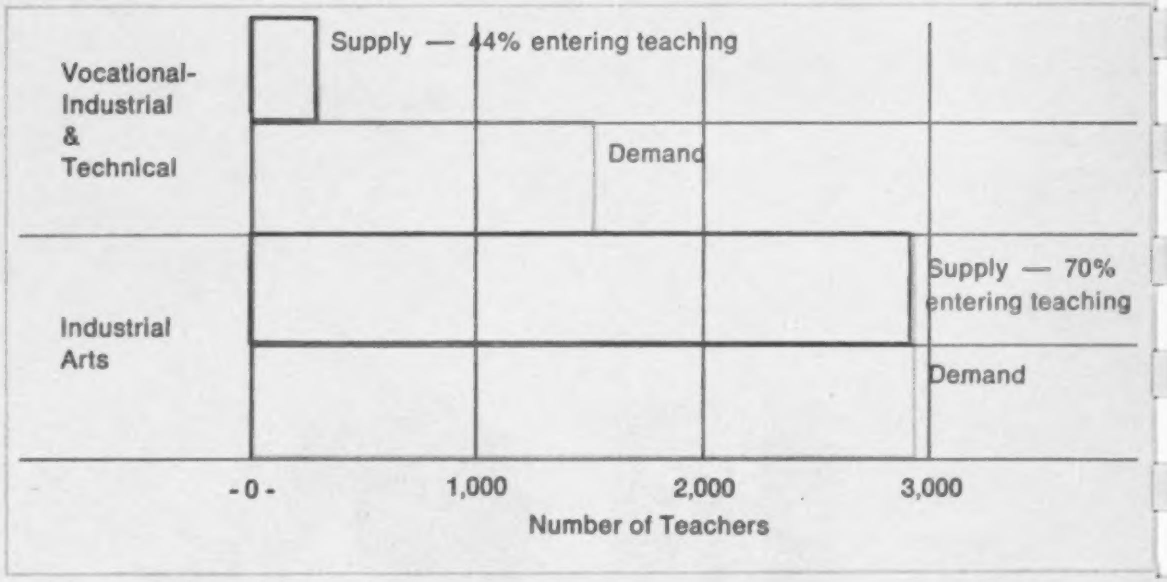
Sources of IE Teachers


Industrial Arts Teacher
Vocational-Industrial Teacher
Technical Teacher
Professional Preparation to Teach
Work Experience
Military
Bachelor's Degree in Industrial Education
College or University with Major in Industrial Arts
Community-Junior College
Bachelor's Degree in Engineering or Engineering Technology or Industrial Technology
Master Craftsmen in Industry
Apprenticeship or Vocational School
High School Students Interested in Vocational-Technical Work and Teaching
More Common Route
Less Common Route

10 *What are the facts about the supply of and the demand for IE teachers?*

The Supply Is Low.
Placement directors, city and state supervisors, and national IE associations report a severe shortage of IE teachers. Over one-half of all states had extreme difficulty filling industrial arts positions in 1968-69—over one-fourth had extreme difficulty filling vocational-industrial and technical teaching positions.

Supply and Demand for Beginning Teachers for 1968 (NEA)



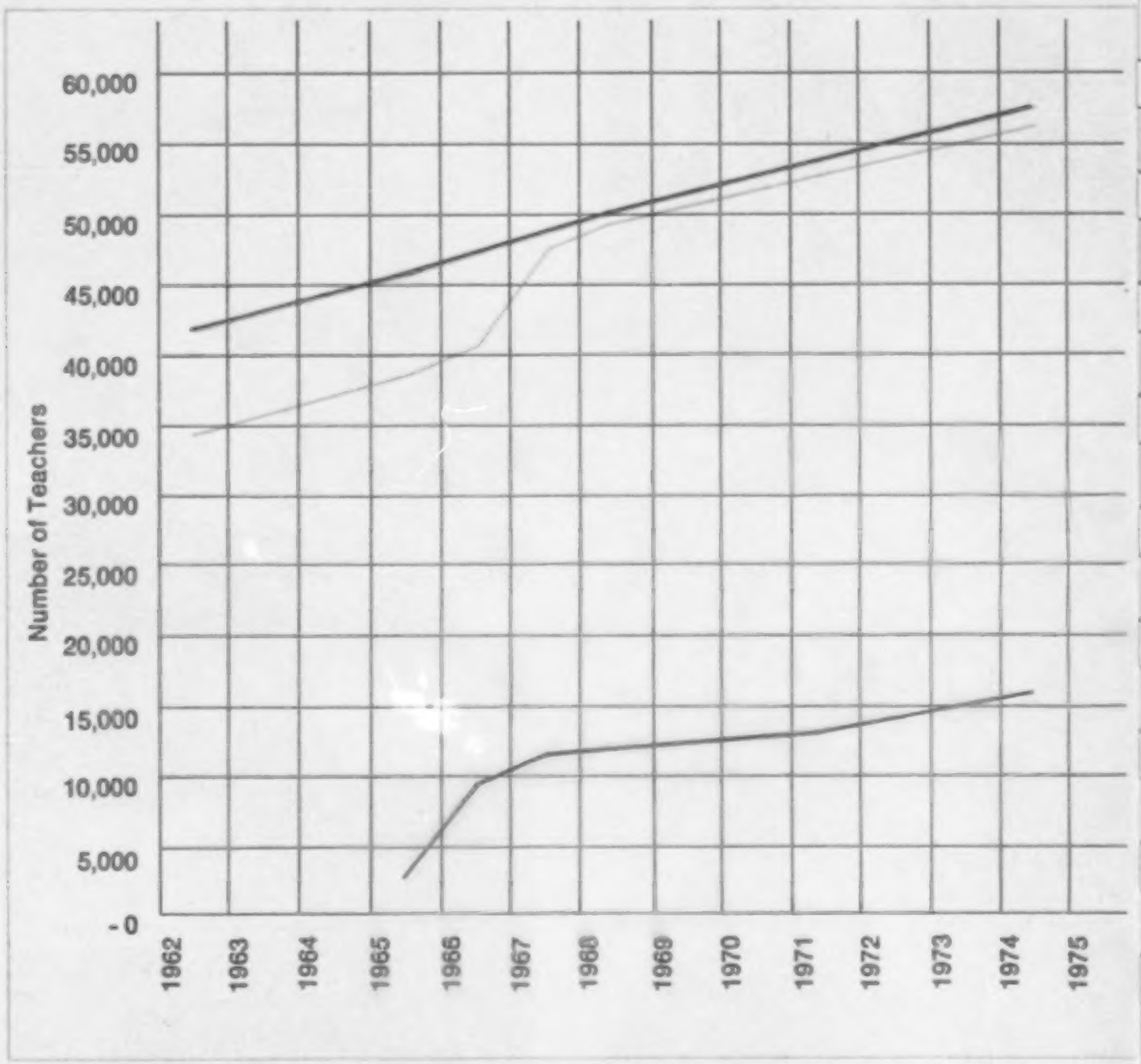
The Demand Is High.
The explosive increase of secondary and post-secondary IE programs has created a heavy demand for teachers. At least 20,000 new IE teachers are needed annually for additional and replacement positions.

Industrial Arts Teachers		
1962-63	**41,728**	**Actual***
1965-66	**45,628**	**Estimated***
1968-69	**49,528**	**Estimated**
1971-72	**53,428**	**Estimated**
1974-75	**57,328**	**Estimated**

Vocational-Industrial Education Teachers		
1962-63	34,483	Actual*
1965-66	38,763	Actual
1966-67	40,248	Actual
1967-68	47,741	Actual
1968-69	49,600	Estimated*
1974-75	56,000	Estimated

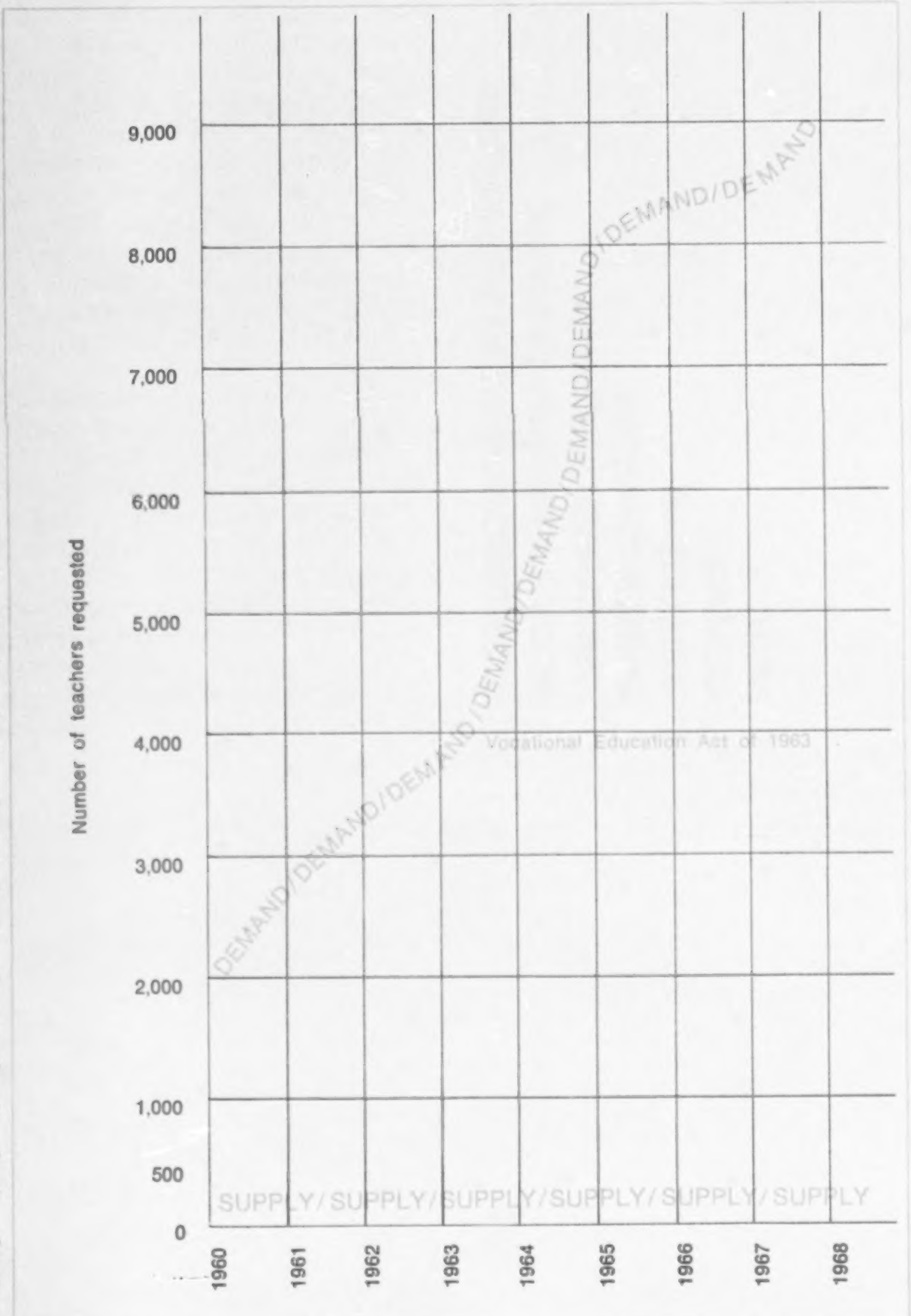
Technical Education Teachers		
1965-66	**3,399**	**Actual***
1966-67	**9,637**	**Actual**
1967-68	**10,318**	**Actual**
1969-70	**12,000**	**Estimated***
1971-72	**13,300**	**Estimated**
1974-75	**15,750**	**Estimated**

(*USOE Information)



Total Number of Industrial Arts, Vocational-Industrial Education, and Technical Education Teachers (USOE)

Growth of Industrial Education Supply and Demand in Michigan (Michigan Council on Industrial Arts Teacher Education)



There Is A Critical Shortage Of Teachers.

School districts are forced to employ unqualified and substandard teachers. In 1968-69, teachers with substandard qualifications were employed by most states for industrial arts and by eleven states for vocational-industrial and technical education/

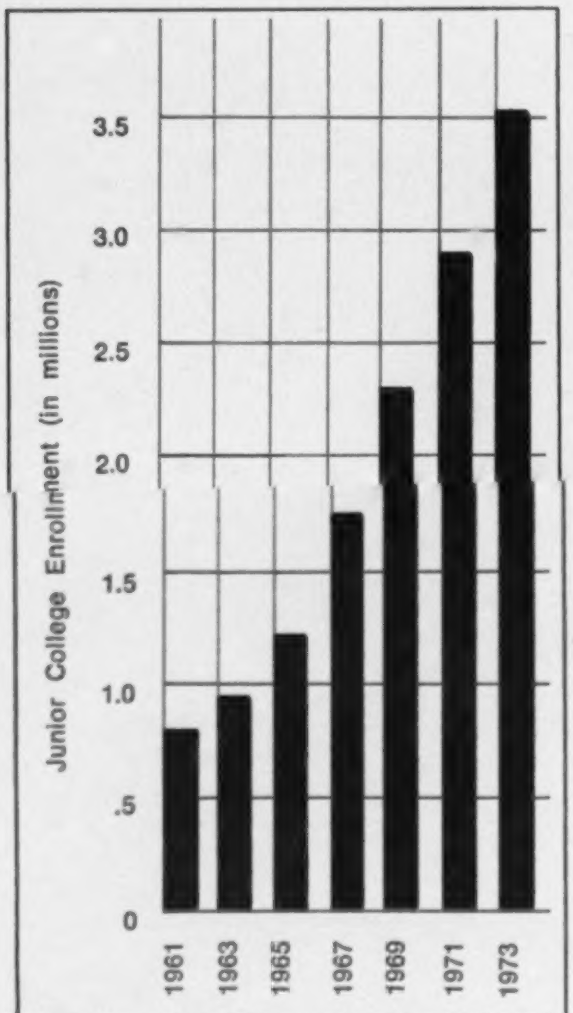
In August of 1968, 45 large school districts had 284 unfilled positions in industrial arts and 20 large districts had 89 unfilled positions in vocational-industrial and technical education/

Many industrial arts laboratories are closed and equipment idle because teachers are not available. The gap between supply and demand grows wider each year.

New sources of qualified IE teachers must be found. An excellent source, which serves as the central point of this bulletin, is the body of students attending the C-JC in vocational-industrial, technology, or college transfer programs.

Community-Junior College And IE Teacher Preparation

12 An examination of statistics will reveal the great need for a cooperative program for preparing teachers/
There are about 750 public C-JC in the United States enrolling 90 percent of all C-JC students/
Over 2,000,000 students are enrolled in these schools. The number of students will rise to 3,444,000 in the next five years/
Six states; namely, California, New York, Texas, Illinois, Michigan, and Florida are among the nine largest in population/
Over 270 C-JC are located in the six states covered by this study—more than one-third of all public C-JC/
Approximately one-third of the students in C-JC are enrolled in occupational programs including vocational-industrial, technical, business, health, distributive, agriculture, home economics, etc/
Eighty percent of all students going to college in California are in the C-JC while the percentage in Florida is 66/
Twelve percent of those entering the C-JC in 1966 were nonwhite/
Over 70 percent of the students in IE enrolled in teacher preparation in IE in the SI in the six states covered by this study are transfers from C-JC/
While the demand for IE teachers has increased dramatically, the SI have not reflected a comparable increase in the number of students enrolled in teacher preparation in IE/



(American Association of Junior Colleges)

Solving The IE Teacher Shortage

To increase the supply of IE teachers, the following are essential:
Curriculum coordination (articulation) between the C-JC and SI including the development of a pre-industrial teacher curriculum/
Orientation of faculty, counselors, and administration of the C-JC and the SI to needs and opportunities/
Assessment of the vocational-industrial and technical staff and laboratory facilities available in in C-JC and SI for IE/
Improvement of admission and transfer policies for smoother transition from the C-JC to the SI/
Better guidance and counseling for potential IE teachers at both institutions including recruiting programs/
Publicity aimed at interesting students in industrial arts, vocational-industrial, and technical education with emphasis on improving the "image" of these programs/

The Future

Future Needs

How can the recommendations in this bulletin be implemented?

Each state should develop a master plan for preparing IE teachers including those needed for industrial arts, vocational-industrial education, and technical education. Leadership personnel in the state department, SI, and the C-JC should take the initiative in developing such a plan/

This bulletin should be utilized to increase the quality and quantity of IE teachers for each state/

National professional organizations need to work together to increase the supply of teachers. A national consortium on teacher education should be organized consisting of representatives of the American Association of Junior Colleges, American Industrial Arts Association, American Technical Education Association, American Vocational Association, American Industrial Technology Association, National Association of Industrial Teacher Educators, and others/

There should be a conference of directors of admissions and vice presidents in charge of instruction in SI covered by this study to develop guidelines for accepting transfer credit from C-JC/

Representatives of the C-JC in each state should meet as a group to discuss and identify their roles in preparing IE teachers/

A study of the other 44 states, particularly those with emerging programs in C-JC and area vocational schools (skill centers), should be initiated/

The aim should be to see what benefits may be derived from this bulletin and to determine what additional problems there may be in establishing articulation between new C-JC and existing SI/

Each state should appropriate monies for a long-term study of their total occupational teacher education programs. Existing programs should be identified and future needs determined. Each SI in the state should be given specific responsibility for providing programs at the bachelor's, master's, and doctoral levels for all types of IE teachers, counselors, and administrators/

A USOE contract should be granted to an appropriate SI to establish and maintain a center devoted to the problems of supply and demand of IE teachers, particularly as this relates to the growth of the C-JC/

A new model IE teacher curriculum should be established at an SI in line with the recommendations of this study. The model can serve as a guide for other SI interested in establishing a better articulated IE teacher curriculum with the C-JC in their area/

Programs of in-service education should be developed for C-JC vocational-industrial and/or technical teachers to update their technical skills. These programs should include conferences of all technical teachers in a particular subject-matter area/

In-service seminars should be developed for guidance counselors in the high school, C-JC, and SI to develop better articulation for vocational-industrial or technical programs. These seminars could also serve to update their understanding of manpower needs and the relationship of industrial teacher education to the problem.

Systems of articulation agreements for IE should be recommended and developed between the C-JC and the SI/

curriculum

A curriculum is an organized sequence of courses designed to prepare an individual for a specific occupational objective to be completed in a specified length of time. A course is a selection and organization of specific subject matter that contributes to a curriculum. This section deals with those aspects of curriculum in which the C-JC and the SI can cooperate in preparing IE teachers.

What kinds of vocational-industrial and technical curriculums are offered in the C-JC?

There are three of these kinds of curricula offered; namely:

The vocational-industrial programs, usually one year in length, in the typical trade areas/

The industrial technology programs, two years in length, emphasizing specific laboratory skills and knowledges as well as a good background in science and mathematics/

The engineering technology programs, two years in length, with major emphasis on mathematics, science, and a field of speciality in engineering/

What factors influence the number and variety of curriculum offerings in vocational-industrial and technical education in the C-JC?

The offerings are influenced by the following factors:

Purpose of the Institution.
Some C-JC serve both as area vocational schools and colleges for two year programs in technology. Other C-JC have only two-year technology programs. The latter is particularly true in states with separate area vocational schools. Some C-JC have no vocational-industrial or technical programs but offer a college parallel program/

Total Student Enrollment.
Small schools, under 1,000, may offer only two or three curricula in vocational-industrial and technical education. Larger schools, from 1,000 to 5,000, may offer from four to ten choices. Very large C-JC may have as many as 30 different curriculums in the one- and two-year vocational-industrial and technical areas/

Enrollment in Occupational Areas.
Some C-JC have no occupational programs and, therefore, no enrollments. In other C-JC, more than fifty percent are enrolled in occupational programs, with a national average of 30 percent/

Geographic Location in the State.
Rural C-JC tend to emphasize vocational-industrial programs because of the limited industrial arts and vocational backgrounds of the students. Urban C-JC tend to offer more two-year programs in industrial and engineering technology/

6 Geographic Location in the United States.

While many technology programs, such as civil, mechanical, drafting, electronics, and data processing are common throughout the United States, C-JC in certain areas have programs in forestry, atomic energy, aerospace, and other specializations/

Background of the Dean of Technical Studies.

If the dean is an IE graduate, the emphasis tends to be more on vocational-industrial and industrial technology areas. If the dean is an engineering graduate, the emphasis is on the engineering technologies/

Industries in the Service Area.

Most C-JC indicate that their vocational-industrial and technical offerings are based on an area survey of the local industries and their needs for certain skilled personnel. Advisory committees are normally utilized in planning the content of the curriculum. The advisability of this procedure may be questioned because of the highly mobile nature of the graduates/

Staff.

Some vocational-industrial and technical programs are established because a person is available who can teach certain courses. This is a very poor approach to curriculum planning. Program selection should precede staff appointments/

What are the common programs in IE which are offered in the SI?

There are over 275 institutions offering degrees in IE in one or more of the following areas:

Bachelor of Arts or Science Degree with a Major in Industrial Arts.

Some schools offer one major only in the broad area of industrial arts including courses in wood, metal, electricity-electronics, power-automotives, drafting, plastics, and graphic arts. Some smaller institutions may offer no courses in certain technical areas, such as plastics, graphic arts, or power-automotives. Other larger institutions offer majors and minors with specialities in areas of drafting, wood, metal, electricity-electronics, plastics, graphic arts, and power-automotives/

Bachelor of Science Degree with a Major in Vocational-Industrial Education.

This degree requires trade experience either before, as a part of, or after the degree program and a major in a specific trade area/

Bachelor of Science Degree with a Major in Technical Education.

This program has greater emphasis on mathematics, science and technical courses taught in the typical technologies in the C-JC/

What are the teaching opportunities in IE?

The opportunities are as follows:

Industrial Arts in the Junior High or Middle School.

A typical teaching assignment includes courses in general industrial arts (some work in metal, wood, drawing, electricity, power, and graphic arts) or courses such as construction, manufacturing, energy and power, communications, and general industry/

Industrial Arts in the Senior High School.

Typical teaching assignment includes specific courses in drafting, woodworking, building construction, metalworking, automechanics, electricity-electronics, graphic arts, plastics, and many others/

Vocational-Industrial (T & I) at the Upper Senior High School, Area Vocational School, or Vocational Division of the C-JC.

Typical teaching assignment: teach courses in welding, machine shop, carpentry, etc., or related subjects in mathematics and science/

Technical Education in Technical Institutes and C-JC.

Courses taught in the area of specialty, such as metallurgy, electronics, drafting, fluid power, quality control, and others/

What are the typical course offerings in the various curriculums in the C-JC?

The number, variety, and type of individual courses depends, to a large degree, on the size of the institution and the variety of vocational-industrial and technical curricula offered. Typical technical course offerings by title are shown in the following chart. In the technology curriculums, the greatest number of course offerings are in drafting, electricity-electronics, and metalworking—in this order. The fewest number of courses are offered in graphic arts, woodworking, building construction, and power-automotives. The number and concentration of technical courses offered vary from state to state.

Drawing-Drafting

Descriptive Geometry
Engineering Drawing
Technical Drawing
Industrial Drawing
Industrial Design
Tool & Die, Jigs, Fixtures
Electrical Drafting
Highway Drafting
Architectural Drawing
Blueprint Reading
Engineering Graphics
Technical Illustration & Sketching
Automotive Drafting & Design
Pattern Drafting

Electronics

Basic Electronics
Communication Electronics
Applied Measurements
Industrial Electronics
Transistor Electronics
Basic Circuits
Digital Computer Electronics
D. C. Circuits & Systems
A. C. Circuits & Systems
Electronics Mathematics
Radio & T.V. Electronics
Electronic Drafting
Advanced Electronics & Tech. Prob.
Electrical Machines
Vacuum-Tube Characteristics
Instrumentation
Electrical Power Distribution
Electronics Troubleshooting
Microwave Fundamentals
Audio-Visual Equipment Repair

Electricity

Basic Electricity
Industrial Electricity
Circuitry
Instrumentation
Electricity & Magnetism
Residential & Commercial Wiring
Appliance Service & Repair
Power Sources
Electrical Fundamentals (A. C. Current)
Electrical Fundamentals (D. C. Current)
Audio & Power Transmission

Graphic Arts

Introduction to Graphic Arts
Camera Techniques—Photography
Offset Processes
Production Techniques-
  Graphic Reproduction
Letterpress Processes
Copy Preparation
Estimating
Production Control

Power-Automotive

Auto Engines—Introduction
Electrical & Ignition
Carburetors & Fuels
Suspension & Brakes
Transmission & Driveline
Tune-up & Testing
Accessories, Service, and Air Conditioning
Supervision & Management (Auto Service)
Engine Overhaul
Engine Dynamometer
Automobile Safety
Diesel Mechanics
Hydraulics—Technology
Small Engine Fundamentals
Basic Mechanics
Fluid Power Pumps & Compressors
Fluid Power Controls
Fluid Power Circuits
Servo Systems
Fuels & Lubricants
Wheel Balancing & Alignment

Woodworking & Building

Cabinetmaking
Patternmaking
Residential Construction
Commercial Construction
House Design & Improvement
Architecture
Finishing

Metalworking

Machine Shop
Metallurgy
Manufacturing Processes
Quality Control
Industrial Materials
Tool and Die
Jig and Fixture
Welding
Sheet Metal
Foundry
Forging
Heat Treatment

Are the technical courses offered in the C-JC compatible with and suitable for the first two years of preparation in IE?

In many cases, the basic courses offered in both institutions are similar in content covered, textbooks used, and teaching methods employed. Technical courses in SI tend to emphasize more construction activities and, in some cases, educational philosophy of teaching the content.

Who should be concerned with the supply and demand for IE teachers in each state?

The responsibility for preparing IE teachers has been complicated by the rapid growth of the C-JC and by the addition of nonteaching technical programs in the SI, particularly those in industrial and engineering technology. If there is to be an adequate supply of IE teachers, the responsibility for recruiting and preparing the teachers rests with the following groups:
State departments of education including the supervisors of industrial arts, vocational-industrial, and technical education/
Department heads of IE in SI and other representatives from that institution/
Deans of technical studies in C-JC and other representatives from these institutions/
Local and area supervisors of IE/

What is the best procedure to follow in developing a cooperative articulated program of teacher preparation in IE between the C-JC and SI?

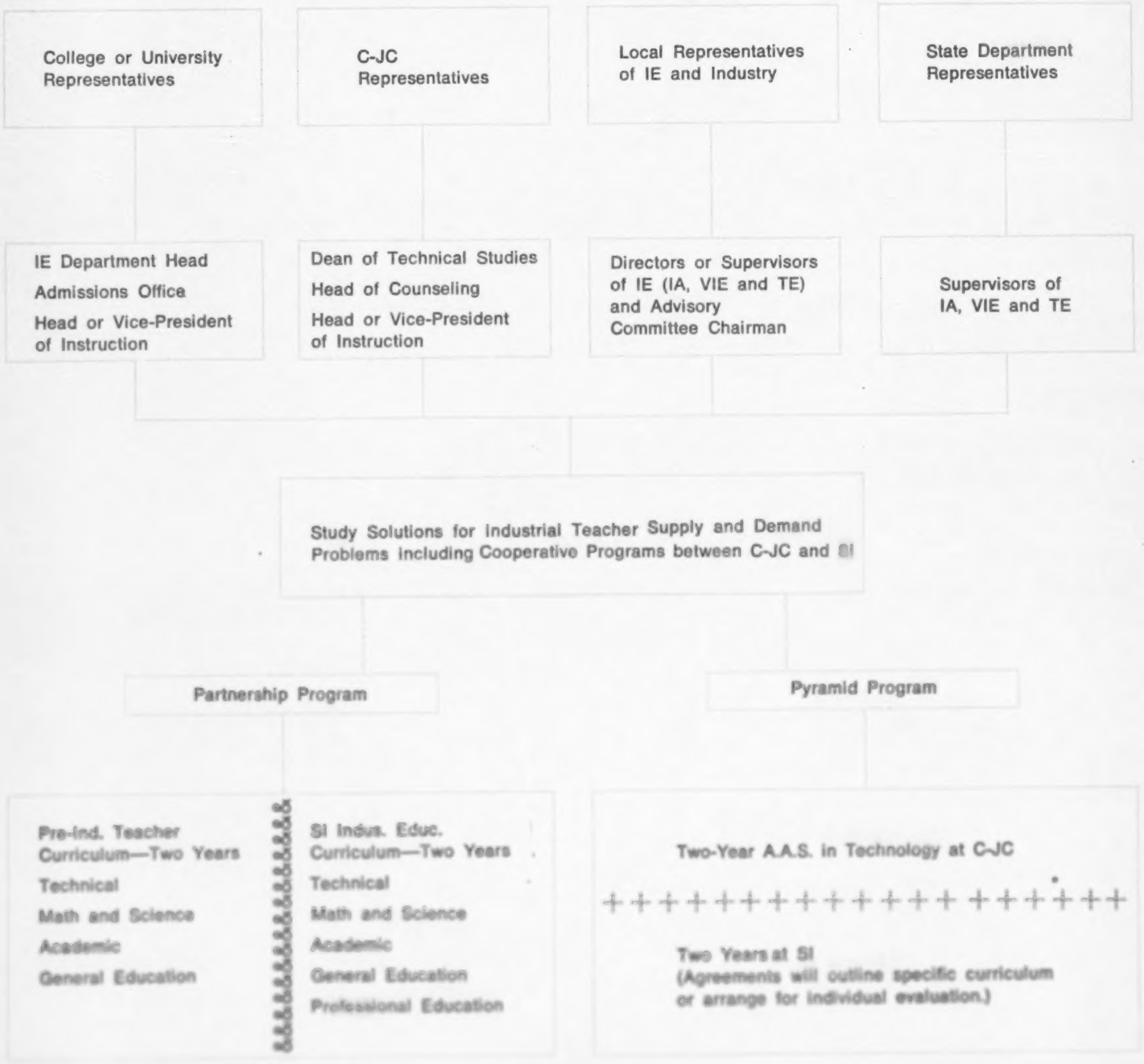
Arrange a meeting on an area or statewide basis of the personnel as shown in the chart.

This task force should consider the needs for various IE teachers and the methods for preparing them. In doing so, they should:
Identify the qualities and capacities of IE teachers needed at various levels in the state including junior high schools, senior high schools, area vocational schools, and C-JC/
Define the desirable competencies for each of these teachers in terms of educational experience, work experience, and teaching ability/
Consider the C-JC, SI, business, industry, military, and government as institutions of learning which together make up the total source of the educational experience of IE teachers/
Determine how each institution represented can best make a contribution toward preparing IE teachers/
Take full advantage of the facilities, staff, and curriculum offerings of each of the institutions to provide the necessary learning experience/
Develop an articulation agreement for accepting transfer credit that can be presented to the C-JC and SI controlling board for adoption/

Who should be responsible for the initial contact in developing a pre-industrial teacher curriculum for C-JC?

Generally, it is the responsibility o IE department heads to make the first contact in developing a pre-industrial teacher curriculum in thei service areas. However, deans of technical studies may also initiate contacts with the idea of increasin the career opportunities of students enrolled in vocational-industrial or technical programs. If the department head makes the first contact, it is recommended that a course equivalency sheet(s) be developed for the technical courses, pairing those in the SI with those in the C-JC. (See following chart.) This approach makes it possible for representatives from the C-JC and the SI to discuss the course conten to determine if, in truth, the same material is covered in each of the courses. It also provides an openin approach to the exchange of information concerning courses, curriculum, staff, facilities, counseling, and other problems related to the establishment of a pre-industria teacher curriculum.

Typical task force for preparing IE teachers in each area of the state or on a statewide basis*


College or University Representatives
C-JC Representatives
Local Representatives of IE and Industry
State Department Representatives
IE Department Head
Admissions Office
Head or Vice-President of Instruction
Dean of Technical Studies
Head of Counseling
Head or Vice-President of Instruction
Directors or Supervisors of IE (IA, VIE and TE) and Advisory Committee Chairman
Supervisors of IA, VIE and TE
Study Solutions for Industrial Teacher Supply and Demand Problems including Cooperative Programs between C-JC and SI
Partnership Program
Pyramid Program
Pre-Ind. Teacher Curriculum—Two Years
Technical
Math and Science
Academic
General Education
SI Indus. Educ. Curriculum—Two Years
Technical
Math and Science
Academic
General Education
Professional Education
Two-Year A.A.S. in Technology at C-JC
Two Years at SI
(Agreements will outline specific curriculum or arrange for individual evaluation.)

*The task force could include representatives from one or more SI and C-JC depending on needs, leadership, geographic area, size of state and many other factors.

PARTNERSHIP

20 *What are the two major cooperative approaches that can be utilized in preparing IE teachers?*

Partnership Program (Two *and* Two Approach)—A pre-industrial teacher curriculum for the C-JC. This program would outline a specific curriculum at the C-JC designed especially for students who are planning to complete a teaching degree in IE. In this type of program, cooperation between interested personnel in the C-JC and the SI must agree on such matters as:

Academic Requirements in each of the two institutions and how these may be transferred/

Technical Offerings in the C-JC which are suitable for teacher preparation in IE/

New Courses needed in technical or professional areas/

The two-year, pre-industrial teacher curriculum should be worked out so than an articulation agreement can be reached between the two institutions. The program should be included in the C-JC catalog as another career opportunity. Community-junior colleges, in turn, should advise high school seniors of the opportunities for beginning their preparation as IE teachers at the C-JC level. This curriculum, listed in the C-JC catalogs, should outline specific courses to be taken the first two years of this program. Whenever possible, at least one professional education course should be offered during the first two years to orient students to IE teaching.

Typical Industrial Arts Teacher Education Model.

TWO	TWO
Pre-Industrial Teacher Curriculum at C-JC/64 S.H.	B.S. or B.A.* with Major in Industrial Arts at SI/64 S.H.
Basic Technical—40 to 50% (Percentage of C-JC Program) As many basic courses in various technologies as may be available including drafting, electricity-electronics, metalwork, and, if available, graphic arts, power-automotive, building construction, and plastics.	Advanced Technical—40 to 50% (Percentage of SI Program) Necessary courses to complete competencies needed to teach in junior or senior high school industrial arts.
General Academic—25 to 35% Academic equivalency often indicated in C-JC and SI catalogs. More academic if fewer technologies are available.	General Academic—20 to 25% Complete necessary SI requirements.
Mathematics and Science—15 to 20%	Mathematics and Science—10 to 15%
General Education Courses—0 to 5% as available.	General Education Courses—20 to 25% including student teaching.
	Professional IE—10 to 15%

*Some states requiring five years for teaching certificate will need to adjust SI program.

Actual Pre-Industrial Teacher Curriculum Following Guideline Model

Kellogg Community College
Battle Creek, Michigan

Curriculum for Industrial Arts Secondary Education Transfer to Western Michigan University

First Semester	Credits
English 101A	3
Science Elective*	4
Technical Mathematics***	4
Technical Electives**	6
Total	17 hrs.

Second Semester	Credits
English 101B	3
Science Elective*	4
Humanities Elective*	3
Technical Electives**	6
Total	16 hrs.

Third Semester	Credits
Social Science Elective*	3
Humanities Elective	3
Technical Electives**	6
Education 201	3
Physical Education	1
Total	16 hrs.

Fourth Semester	Credits
Political Science 200	3
Humanities Elective*	3
Technical Electives**	6-9
Physical Education	1
Total	13-16 hrs.

*
Courses should be chosen to meet the specific transfer requirements of Western Michigan University.

**
Technical Elective should be chosen based on your selected Industrial Arts major and minor.

***
Select Technical Mathematics 11 or Mathematics based on high school background.

Select from the following a major and a minor area of study:
Drafting, Electricity-Electronics, General Industrial Arts, Metalworking

Recommended Courses

A given course may be applied to either a major or minor but not both, even though it is listed for both the selected major area and the selected minor area.

Electricity-Electronics

Major	Credit Hours	Minor	Credit Hours
Electronics 13	3	Electronics 13	3
Electronics 14	3	Electronics 14	3
Electronics 15	3	Electronics 15	3
Electronics 22	3		
Electronics 23	3		

Drafting

Major	Credit Hours	Minor	Credit Hours
Drafting 11	3	Drafting 11	3
Drafting 12	3	Drafting 12	3
Drafting 13	3	Drafting 13	3
Drafting 21	3	Drafting 21	3
Drafting 23	3		
Drafting 15	3		

General Industrial Arts

Major	Credit Hours	Minor	Credit Hours
Mechanical Technology 13	3	Mechanical Technology 13	3
Mechanical Technology 14	3	Mechanical Technology 14	3
Electronics 10	3	Electronics 10*	3
Drafting 11	3	Drafting 11	3

*Do not select if Electricity-Electronics is major area.

Metalworking

Major	Credit Hours	Minor	Credit Hours
Mechanical Technology 11	3	Mechanical Technology 11	3
Mechanical Technology 13	3	Mechanical Technology 13	3
Mechanical Technology 14	3	Mechanical Technology 14	3
Drafting 11	3	Drafting 11	3

PYRAMID

22 Pyramid Program (Two *plus* Two Approach)—Building a B.A. or B.S. degree at the SI on the two-year A.A.S. degree in one of the engineering or industrial technologies.

This program is best suited to preparing teachers for some types of senior high school industrial arts, vocational-industrial education, and technical education. The SI would accept the first two years of the A.A.S. in technology as the first two years of teacher preparation in IE. The SI then has the responsibility of building on these first two years to develop a competent teacher in a specific vocational-industrial or technical area. The SI could handle the last two years on an individual student basis or may provide a catalog listing of the specific requirements necessary to complete the degree beyond the first two years of the A.A.S. program.

Typical Vocational-Industrial Teacher Education Model

TWO

Two (A.A.S. in Industrial Technology at C-JC and Industrial Experience)

Automotive Technology Curriculum at C-JC/64 S.H.

Summary:
50-70% Technical—Automotive and Related Courses
10-30% General Academic Studies
10-20% Mathematics and Science

+ + + + + + +

Vocational-Industrial Curriculum at SI/64 S.H.

Summary:
30-50% Technical—including Advanced Technical Courses, Trade Competency Tests, and/or Work Experience
20-25% General Academic
10-15% Mathematics and Science
25-30% Teacher Education

TWO

Two (B.S. in Vocational-Industrial Education)

Automotive Technology Curriculum Outline

First Semester	S.H.
Mathematics	4
Physics	3
Manufacturing Processes	3
Power and Power Flow 1	3
Chassis and Components 1	3
Total	16
Second Semester	**S.H.**
Communications	4
American Civilization	3
Automotive Electricity	3
Charts, Diagrams, and Handbook Usage	2
Power and Power Flow 2	2
Chassis and Components 2	2
Total	16
Third Semester	**S.H.**
Speech or Communication	3
Automotive Service Mgt.	2
Power and Power Flow 3	3
Body and Accessories 1	3
Automotive Field Work 1	5
Total	16
Fourth Semester	**S.H.**
Human Relations	3
Parts and Service Merchandising	2
Body and Accessories 2	3
Automotive Field Work 2	5
Elective (Academic)	3
Total	16

Typical Technical Teacher Education Model

TWO

Two (A.A.S. in Engineering Technology at C-JC and Industrial Experience)

Metallurgical Technology Curriculum at C-JC/64 S.H.

Summary:

50%	Technical——Metallurgy and Related Courses
25%	General Academic Studies
25%	Mathematics and Science

+ + + + + + +

Technical Education Curriculum at SI/64 S.H.

Summary:

25%	Technical—Advanced Technical or Engineering Courses, Work Experience Courses
20-25%	General Academic Studies
10-20%	Mathematics and Science
20-25%	General Education including Student Teaching and/or Internship
20-25%	Professional Education Courses

TWO

Two (B.S. in Technical Education)

Metallurgical Technology Curriculum Outline

First Semester	S.H.
Mathematics 1	5
Physics 1 (Heat and Optics)	3
General Chemistry	3
Communication Skills	3
Introduction to Metallurgy	2
Total	16
Second Semester	**S.H.**
Mathematics 2	4
Physics 2 (Mech. and Elec.)	3
Analytical Chemistry	3
Foundry	2
Technical Reporting	2
Technical Draw. and Graphic Representation	0
Academic Elective	2
Total	16
Third Semester	**S.H.**
Physical Metallurgy and Metallography	4
Properties of Materials	4
Refractories and Furnaces	2
General and Indus. Econ.	3
Academic Elective	3
Total	16
Fourth Semester	**S.H.**
Process Metallurgy	4
Nondestructive Inspection	3
Control Instrumentation	3
Industrial Organizations and Institutions	3
Academic Elective	3
Total	16

Should A.A.S. technology graduates be eligible for full credit in transferring to a baccalaureate degree program in IE?

Graduates should be granted full credit toward the bachelor's degree requirements in vocational-industrial and technical education and, in some cases, as unit shop teachers in industrial arts. However, the SI and the cooperating C-JC should agree on policies.

How much credit should C-JC students be allowed to transfer to SI?

Community-junior college courses with content suitable for teacher preparation in IE should be accepted at face value to the limits provided by the institution. Community-junior college courses in vocational-industrial and technical areas should be evaluated by a committee of representatives from the C-JC and SI and, wherever possible, course equivalencies established.

Western Michigan University Industrial Education Equivalents

Students enrolled in technical programs in Michigan C-JC can apply technical courses to a 30-hour major and a 20-hour minor in IE as indicated below. Up to 50 percent of the technical courses taken in C-JC may apply toward the 50-semester hours which comprise a major and minor. (For General Studies Equivalents, see W.M.U. Undergraduate Catalog.)

Each student must have one, 30-hour teaching major and one, 20-hour minor in any combination of the following areas:

Drawing
Electricity-Electronics
General Industrial Arts
Graphic Arts and Printing Management
Metalworking
Power-Automotive
Woodworking

For example, a student may major in drawing and minor in metal work.

WESTERN MICHIGAN UNIVERSITY		MUSKEGON COUNTY COMMUNITY COLLEGE		
Course	Sem. Hrs.	Course	Sem. Hrs.	
120 Survey of Drafting	3	Draft. 100 Intro. of Graphic Representation	3	Drawing
226 Industrial Graphics	3	Draft. 101 Elements of Indus. Drafting	3	
227 Technical Sketching	3			
231 Descriptive Geometry	3	Draft. 201 Geometry of Drafting	3	
326 Advanced Industrial Graphics	3			
330 Machine Drafting	3	Draft. 102 Ele. of Machine Drafting	3	
331 Production Drafting	4	Draft. 202 Production and Graphic Illus.	3	
520 Architectural Graphics	4			
522 Laboratory Practices in Drafting	2	ElTr. 104 Electronic Drafting	3	
Electives		Draft. 203 Struc. and Facility Plan.	3	
		Draft. 204 Jig and Fixture Design	3	
		Draft. 205 Production Drafting	3	
160 Basic Electricity	3	ElTr. 103 Basic Electronics	4	Electricity-Electronics
240 Electrical Circuits	3	ElTr. 101 DC Circuits and Systems	3	
241 Electronic Circuits	3	ElTr. 102 AC Circuits and Systems	3	
242 Electromagnetic Devices	3	ElTr. 202 Industrial Elec. Systems	3	
3 ctr erv Tec es		E 01 oni adic T.V		

460 Laboratory Practices in Electricity-Electronics	3			
120 Survey of Drafting or 226 Industrial Graphics	3	ElTr. 104 Electronic Drafting	3	
130 General Metals	3			
560 Electricity-Electronics for Teachers	2			
Electives		ElTr. 203 Elect. Machines	4	
		ElTr. 204 Semi-conductors	3	
		ElTr. 205 Elect. Circuit Design	3	
		ElTr. 206 Ind. Electronic Systems	4	
		ElTr. 207 Advanced Elect. Tech. Problems	4	
100 General Woodworking	3			General Industrial Arts
200 Machine Woodworking	3			
130 General Metals	3			
234 Machine Shop	3	Mach. Tech. 201 Mach. Tech. or Mps. 101 Manu. Materials and Processes	3	
160 Basic Electricity	3	ElTr. 103 Basic Electronics	4	
170 Industrial Crafts Techniques	3			
120 Survey of Drafting	3	Draft. 100 Intro. of Graphic Design or Draft. 101 Ele. of Indus. Draft.	3	
150 Graphic Arts	3	GArt 100 Intro. to Graphic Communications	3	
180 Power Mechanics	3			
276 Industrial Arts Design	2			
570 Arts and Crafts Techniques	2			
573 Mechanics and Conditioning of Equipment	2			
575 General Industrial Arts Laboratory Organization	2			
Electives				
150 Graphic Arts	3	GArt 100 Intro. to Graphic Communications	3	Graphic Arts and Printing Management
152 Letterpress Presswork	3			
250 Typographic Design	5			

253 Science for the Graphic Arts	4		
254 Machine Composition	4		
350 Photolithographic Techniques	3	GArt 102 Copy Preparation and Camera Techniques	4
351 Lithographic Presswork	3	GArt 201 Offset Operations and Bindery Techniques	4
356 Printing Machine Maintenance	4		
450 Advanced Presswork	3		
451 Printing Processes	2		
455 Bindery Operations	2		
552 Estimating	3		
553 Printing Production Control	2		
120 Survey of Graphics or 226 Industrial Graphics	3		
Electives		GArt 101 Intro. to Graphic Repro.	4
		GArt 200 Principles of Photography	3
		GArt 202 Prod. Prac. in Graphic Repro.	4

Metalworking

130 General Metals	3		
170 Industrial Crafts Techniques	3		
120 Survey of Drafting or 226 Industrial Graphics	3	Draft. 100 Intro. of Graphic Representation or Draft 101 Ele. of Indus.. Draft.	3
276 Industrial Arts Design	2		
234 Machine Shop	3	Mach. Tech. 201 Machine Tech.	3
		Mps. 101 Manu. Mat's. and Processes	3
235 Machine Tool Metalworking	3	Mach. Tech. 202 Mach. Tech.	3
332 Tooling and Production Metalworking	3	Mach. Tech. 204 Mach. Tech.	3
334 Metal Forming and Finishing	3	Mach. Tech. 205 Mach. Tech.	3
335 Patternmaking and Foundry	3	CMT 101 Sands and Cores	3
		CMT 201 Gating and Risering	3
		CMT 202 Casting and Pattern Design and Construction	4
		CMT 203 Melting and Pouring	4
		CMT 204 Foundry Practice	3
336 Hot Metalworking	3	Mps. 102 Manu. Mat's. and Processes	3
		Mps. 103 Manu. Mat's. and Processes	3
338 Advanced Metalworking	3		

538 Problems in Metalworking	2			
573 Mechanics and Conditioning of Equipment	2	Mach. Tech. 203 Mach. Tech. Mach. Tech. 206 Mach. Tech.	3 3	
Electives		Mps. 201 Metallurgy	3	
120 Survey of Drafting	3	Draft. 100 Intro. of Graphic Representation or Draft. 101 Ele. of Indus. Draft.	3	Power-Automotive
180 Power Mechanics	3			
160 Basic Electricity	3	Auto. T. 111 Elec. Tune-Up	3	
280 Applied Energy and Power	4			
126 Automotive Carburetion and Electricity	4	Auto. T. 213 Fuels, Lub., and Cooling Auto. T. 214 Service Mgt.	3 3	
226 Automotive Engines	4	Auto. T. 112 Auto. Power Plant Auto. T. 113 Auto. Power Plant Mps. 105 Hydraulics	3 3 3	
582 Applied Fluid Power	2			
586 Power Laboratory Techniques	2			
Electives		Auto. T. 110 Basic Auto. Auto. T. 210 Power Trains. Auto. T. 211 Auto Transmissions Auto. T. 212 Alignment and Suspension Auto. T. 214 Service Mgt. Auto. T. 215 Auto. Electricity and Drawing	3 3 3 3 3 3	
100 General Woodworking	3	none offered		Woodworking
130 Survey of Drafting or 226 Industrial Graphics	3			
200 Machine Woodworking	3			
201 Wood Finishing	2			
302 Upholstering	3			
306 Residential Building Construction	4			
500 Furniture Production	2			
501 Cabinetmaking	3			
502 Wood Technology	2			
573 Mechanics and Conditioning of Equipment	2			

articulation

Articulation in education may be defined as the efficient and successful joining together of courses and curricula to complete a successful educational experience. In terms of this bulletin, it relates to using the staff, facilities, courses, counselors, and all other educational services of both the C-JC and the SI for preparing IE teachers.

9

What is the present status of articulation between C-JC and SI in areas of industrial teacher education?

Even though 70 percent of the present SI students preparing to become IE teachers are transfers from the C-JC, it is evident that ideal articulation is far from a reality.

There is considerable difference of opinion among IE department heads in SI on current and recommended practices, but in general they believe:

Suitability of C-JC Technical Courses for Teacher Preparation in IE	Yes (%)	No (%)
Technical education teacher	64	36
Vocational-industrial teacher	61	39
Senior high specialist industrial arts teacher	50	50
Junior high general industrial arts teacher	43	57

Department heads indicate that technical courses in C-JC are suitable for vocational-industrial and technical education but not for junior high industrial arts teacher preparation.

Amount of Credit IE Departments Accept in Specific Technical Areas	Rank Order	% of Respondents
Less than the total amount offered by the department	1	28
Same as the total hours offered by IE department in specific technical area	2	26
Some more than total offered by IE department, utilizing special problems and seminar credit	3	18
All technical credit taken by students at the C-JC	4.5	14
Other	4.5	14

Industrial education departments accept less credit in a particular technical area from the C-JC than is offered in their own departments.

Strengths or Weaknesses of C-JC Technical Courses as Preparation for Teaching IE	(%) Strength	(%) Weakness
Less emphasis on project making	58	42
Courses taught by engineers	56	44
More lecture and less lab work	39	61

Industrial education department heads indicate that the technical courses at the C-JC may offer too much lecture and too little lab work for suitability as preparation for teaching IE.

Total Number of C-JC an Individual SI Works with in Articulating Programs	(%) Respondents
1 to 3	39
4 to 6	28
7 to 9	10
All C-JC's in state	23

Most IE departments presently work with three or four C-JC in their immediate geographic area. More than two-thirds work with six or fewer.

Responsibility for Evaluating Transfer Credit from C-JC	Rank Order	
	Dept. Head	Ad. Office
Admissions office does all evaluating of both academic and technical courses that can easily be evaluated. Only problem cases referred to department head.	1	1
IE department evaluates technical courses.	2	3
Admissions office evaluates academic courses only.	3	5
Admissions office evaluates all academic and technical courses.	4	2
IE department evaluates all academic and technical courses.	5	4

Currently, most evaluation of transfer credits is done by the admissions office.

Major Problems SI Face with Transfer Students from C-JC	Rank Order Dept. Head	Ad. Office
Students come with too much concentration of credit in one technical area.	1	1.5
Difficult to evaluate the quality of work taken by transfer students in C-JC.	2	1.5
Difficult to plan a teacher education program with only the last two years under control of the SI, IE department.	3	3
No way of accurately evaluating competency of transfer students from C-JC.	4	5
Courses taken by students in C-JC do not match the courses taken at the SI.	5	4
Transfer students from C-JC lose a large amount of credit in transferring to IE.	6	6

Major problems in evaluating credits from transfer students are the excessive concentration of courses in technical areas and the difficulty of evaluating these courses. This indicates a lack of articulation and a need for better coordination.

Methods Used to Evaluate Technical Courses from C-JC	Rank Order Dept. Head	Ad. Office
Course equivalencies accepted at face value.	1	2
Interview with individual students	2	1
Performance tests	3	3
Written, nonstandard tests	4	4.33
None	5	4.33
Written, standardized tests	6	4.33

Technical courses are evaluated by accepting them at face value or based on interviews with students.

Factors Used for Establishing Quality of Technical Courses in C-JC for Teacher Preparation in IE	Rank Order	(%) Respondents
Department head's general knowledge of the C-JC	1	23
Staff qualifications at C-JC	2	18
Laboratory facilities at C-JC	3	15
Department head visitation of technical department at C-JC	4	14
Course outline used	5.5	12
Laboratory time required	5.5	12
Textbook used	7	6

Both IE department heads and admissions offices use general background information, such as a general knowledge of the C-JC, its staff and facilities, to evaluate the quality of the technical courses offered in the C-JC.

Methods Used in Establishing Quality of C-JC Technical Courses for Teacher Preparation in IE	Rank Order	(%) Respondents
Course description in C-JC catalog	1	36
Admissions office knowledge of C-JC	2.5	21
Admissions officers visit with the technical department in C-JC	2.5	21
Course outline used	4	13
Qualities of staff	5	9

College Credit for Occupational Experience	Yes (%)	No (%)
Industrial arts majors	27	73
Vocational-industrial education majors	55	45
Technical education majors	32	68

Most IE department heads indicate that occupational experience should be given college credit for vocational-industrial majors but not for industrial arts, and less than one-third believe it should count for technical education. The common methods of evaluating occupational experience appear to be testing, interviews, and records.

Methods Used to Evaluate Occupational Experience	Yes (%)	No (%)
Testing (written and performance)	86	14
Interview (individual and committee)	78	22
Records and recommendations of employers	78	22

Present Method Used by IE Department Heads to Keep C-JC Counselors Informed about Careers in the Teaching of IE	Rank Order
College catalog contains information that describes in a general way the opportunities of transferring technical credit from C-JC to SI.	1
Departmental staff visits C-JC and talks to counselors and vocational-industrial and/or technical staff.	2.5
Descriptive folders of your department and opportunities in IE are sent to counselors.	2.5
Counselors from C-JC brought to campus for visit and orientation.	4
Specific equivalency sheets showing departmental requirements and equivalent courses at C-JC.	5
Scholarship information relating to IE sent to counselor.	6
Special audio-visual aids available to counselors about IE.	7
General college catalog describes specific course equivalents for SI.	8

Most IE department heads tend to give major attention to visitation and submission of written material in keeping counselors informed. Admissions offices use exchange visitation more than any other method.

Methods Used by Admissions Officers in SI to Keep C-JC Counselors Informed of Opportunities in IE	Rank Order
Counselors from C-JC brought to campus for visit and orientation.	1
Admissions officers with IE staff visit C-JC to talk with counselors and vocational-industrial and/or technical staff.	2.5
Descriptive folders of specialized departments sent to counselors.	2.5
Admissions staff only visits C-JC and talks with counselors and vocational-industrial and/or technical staff.	4
General college catalog contains information which describes in a general way the opportunities to transfer technical credits from C-JC to SI.	5
Specific equivalency sheets showing IE departmental requirements and equivalent courses in C-JC.	6
General college catalog describes specific course equivalency for general education courses.	7
General college catalog describes specific course equivalents for technical courses.	8

Recommended Methods of Improving Articulation Between Technical Courses Offered in the C-JC and Similar Courses in SI	Rank Order	(%) Respondents
Develop in-service institutes for all technical teachers in a specific technical area, i.e., have all metalworking staff at the C-JC and SI get together in a short institute session.	1	29
Cooperative development of a uniform course outline for each specific technical course at the C-JC and the SI.	2	24
Exchange courses of study and textbook lists for each course between staff of the C-JC and SI.	3	17
Use similar course descriptions in all catalogs to accurately describe the content of the course.	4	14
Other	5	13
Use some course numbers	6	3

Department heads see a need for more in-service institutes and exchange of course materials.

How can articulation of the C-JC programs be best achieved with those of the SI?

The basic philosophy should be one of cooperation and equal sharing of responsibility. Articulation cannot succeed when the SI attempts to establish standards unilaterally. Personnel in both the C-JC and SI should work as equals in attempting to solve the problem of the critical shortage of IE teachers.

What can be done to facilitate articulation between technical courses in the C-JC and the courses in the SI?

Department heads believe that the best method of articulating course content is through cooperative efforts involved in having institutes for technical teachers in both the C-JC and SI, developing uniform course outlines, and exchanging courses of study and textbook lists. Wherever possible, standard course descriptions should be established within each state between various C-JC and SI. State departments should foster such guidelines.

While there is no intention to stifle creativity of individual schools and staffs; students, teachers, advisors, and administrators can work together more successfully when descriptive materials in catalogs are similar and explicit. Any attempt at standard course descriptions should be a cooperative effort among all persons involved. In some cases where there is a high percentage of transfer students from one or two C-JC to a single SI, these schools may want to work together toward a uniform numbering system; in other cases, C-JC vocational-industrial and/or technical staff may want to design some type of uniform description following either state or federal standards. The major purpose of any uniform description is to facilitate articulation between the programs of the C-JC and SI.

What should be the main purpose of evaluating C-JC curricula and courses?

The major purpose is to make certain that students have obtained a particular level of achievement toward their occupational objectives.

How can the quality of technical programs in the C-JC be evaluated?

The best method of evaluation is through an accredited association in which representatives from C-JC, SI, and other interested persons are involved. Once a team has approved an accredited technical program, the SI should then assume that the quality of the C-JC program is as stated and is equivalent to that offered in the SI.

How should related occupational xperience be evaluated for college credit in IE by the SI?

The related experience in business, dustry, and the military should be considered an essential part of the preparation of certain IE eachers, particularly in the areas of vocational-industrial and technical education. This experience hould be evaluated for credit and for possible substitutions of technical courses in which similar or quivalent experience and competency is obtained. The evaluation of occupational experience for redit should follow such standards as the American Council of Education's "Guide to the Evaluation of ducational Experience in the Armed Services."

How can there be better coordination of state plans for the preparation of IE teachers?

There is need for a master plan to be developed in each state to provide the necessary supply of occupational teachers. State departments should work in close coordination with the SI and the C-JC to establish standards for all types of two-year occupational programs as well as degree programs at the bachelor's, master's, specialist's, and doctoral levels so that there will be opportunities in each state for preparing the necessary teachers, counselors, and administrators for occupational education at all levels from elementary through college, and for adult and continuing education.

There must be coordination between the various SI in each of the states so that the requirements for majors, minors, and graduation in technical areas are relatively similar enabling a student to transfer from any C-JC to any SI in a particular state with equal ease. Certain SI in each of the states should be identified as the centers for specialized undergraduate and graduate programs in specific occupational areas and for key personnel. For example, one or more SI should have degree programs at the master's, specialist's, and doctoral levels for C-JC counselors with special orientation toward the occupational areas.

Will the addition of a pre-industrial teacher curriculum to the C-JC increase the teacher potential in IE?

At the present time, most students entering technical programs at the C-JC do so with the career objective of entering industry as technicians. If a pre-industrial teacher curriculum was available, more students would become interested in teaching as a career. It would offer career opportunities for students interested in vocational-industrial and technical education beyond the first two years of college.

What steps can be taken to avoid loss of credit when C-JC students transfer to teacher preparation programs in IE?

The best way to avoid loss of credit is to provide a well articulated program with both the Partnership and Pyramid Programs. This, along with sound student counseling at the high school and C-JC, will eliminate the problem for all students. For students transferring after completing a two-year technical program, the following must be done:

Community-junior college counselors must be made aware of the SI program requirements/
Senior institutions should make plans and establish programs based on the two-year C-JC programs/
Graduate requirements should be based on the abilities needed for certain types of IE teaching positions/
Community-junior college students should be encouraged to elect a pre-industrial teacher curriculum as soon as they choose IE teaching as a profession/

What are the values of course equivalency sheets?

Specific course equivalency sheets showing the exact technical courses offered in the C-JC and equivalent courses in the SI will serve as guidelines in establishing the pre-industrial teacher curriculum. In discussing the establishment of the curriculum in a specific C-JC, department heads can work more effectively with deans of technical studies if there is an attempt to identify certain course equivalencies. However in using this technique, continuous re-evaluation is necessary as numbering and course description additions and changes take place in either institution. This plan works best on a one SI to one C-JC basis. (See section on Curriculum page 24.)

Can a cooperative program of pre-industrial teacher education preparation in a C-JC and SI be completed in four years?

The goal of the program should be to include transfer of all credits without loss. Therefore, if a SI IE program requires four years, it should be completed by both the transfer and the nontransfer student in the same length of time. In states requiring five years for a teaching credential, a cooperative program should be completed in five years. Every effort should be made to articulate the pre-industrial teacher curriculum plus all associate degree technical programs with the four-year IE program.

What admissions policies and procedures can be established at the SI to encourage students to transfer into the IE teacher curriculum?

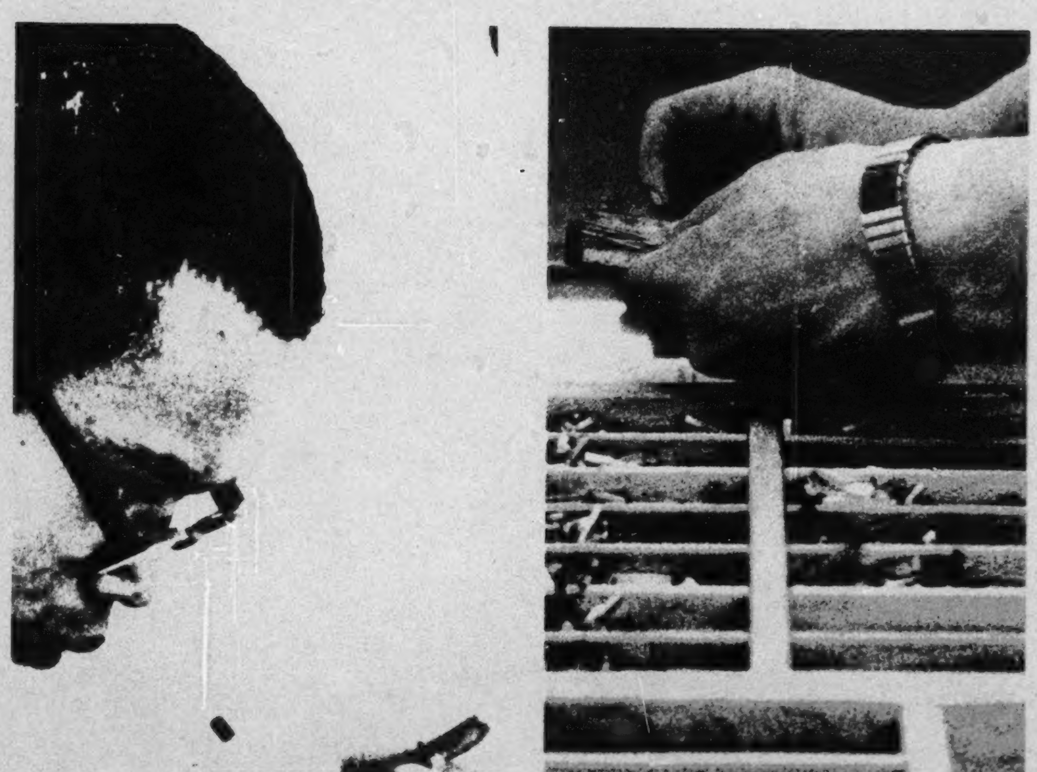
Admissions procedures should be established which will admit all vocational-industrial or technical students from C-JC who are able to profit by additional instruction. Selective admissions practices in SI should be started, if not already in practice, in order that the supply of IE teachers will meet demands.

What needs to be done at state and national levels to make credentialing of IE teachers more realistic and meaningful?

Coordination is needed between various SI, professional organizations, and the U.S. Office of Education to insure standard recommended credentialing of faculty for different levels of IE and different kinds of teaching positions. For example, an entirely different preparation is needed for the junior high industrial arts teacher than for the C-JC engineering technology teacher. However in many states, there is no clear-cut information on standards for each different kind of teacher.

What is the place of internship for preparing IE teachers?

Internships for beginning IE teachers should be implemented for the purpose of helping to make teacher education more relevant. Interns should be assigned to "model programs" of the type in which they are preparing to teach. This means that their professional qualifications should be compatible with those of the institution in which they intern if favorable placement rates are to be achieved.

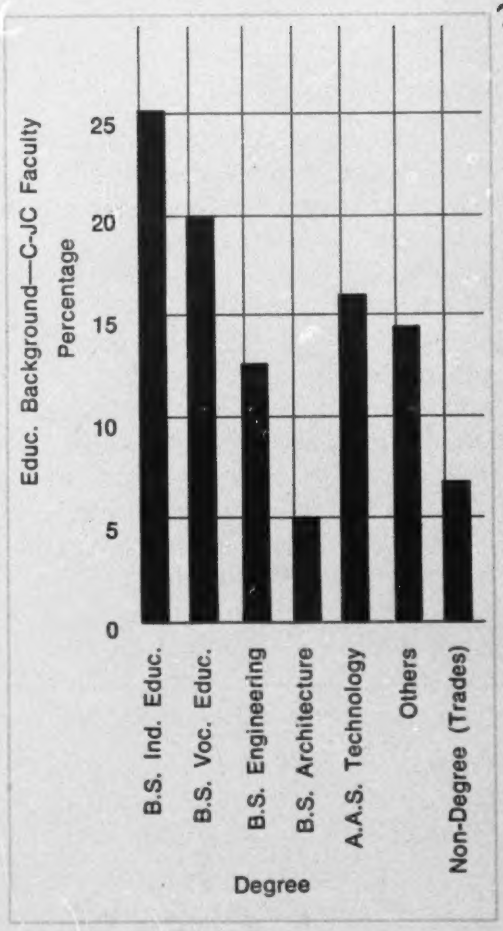


staff and facilities

This section is devoted to the assessment of the vocational-industrial and/or technical staff and physical facilities of the C-JC to determine how these can contribute to the PAP programs.

What are the characteristics of the vocational-industrial and/or technical faculty presently teaching in the C-JC?

Forty-five percent of the faculty hold B.S. degrees in industrial or vocational education, 18 percent in engineering or architecture, and 16 percent have A.A.S. degrees in technical studies. Perhaps of most importance is the figure of 21 percent which includes those holding no degrees and those possessing degrees not directly related to their teaching assignments, an issue that emphasizes the critical need of in-service education programs.



Teaching Experience of C-JC vocational-industrial and/or technical staff. Median is 8.2 years

What should be the characteristics of the good vocational-industrial and/or technical teacher?

The teacher must have abilities in three areas; namely competency in a subject-matter field by virtue of his education and occupational experience, communication (the ability to get this competency across to students) to be effective requires preparation in education and in educational technology including the effective use of audio-visual materials, and compassion for the student and his special needs. The "open-door" policy of the C-JC and the fact that all students are commuters necessitates that the teacher have an entirely different understanding of student problems than does the teacher in the SI.

What is the best composition of staff for vocational-industrial and technical education in the C-JC?

The staff should be representative of different backgrounds of preparation. At least one specialist in each of the programs offered is necessary for a quality program. An institution with limited resources should not attempt to maintain a greater variety of programs than the staff and facilities can adequately handle.

What additional training should the two-year associate degree graduate from an industrial or engineering technology program have to become a qualified vocational-industrial and/or technical teacher in the C-JC?

The A.A.S. degree graduate should have had several years of work experience as an industrial or engineering technician with two additional years of work at the upper division level leading to a bachelor's degree in his specialty. Degrees in vocational-industrial education, engineering, architecture, etc., would be appropriate. In all cases, it is necessary that course work in teaching methodology and the theory of technical education be included in the program of study. Continuing work toward the master's degree in technology is essential.

What additional education is necessary for the holder of a B.S. degree in industrial arts or vocational-industrial education to become an effective vocational-industrial and/or technical teacher in the C-JC?

The person with a B.S. degree needs additional subject-matter competence in his technical area built on a base of math and science leading to a master's degree in technology. Such course work should provide deeper technical understanding of his specialty and should be of an advanced nature. These may well be courses offered by departments of engineering and technology as well as the larger IE departments. These programs may require remedial work in the sciences and mathematics. A careful program of study should be planned by the graduate advisors in consultation with the student and all other departments concerned. These programs should be tailored to meet the needs of the individual student. In some cases, the existing master's degree program in technology will be adequate; in other cases, it will not be.

Survey results show that 45.8 percent of C-JC vocational-industrial and/or technical faculty hold the master's degree.

What additional education should the B.S. degree engineer have to become an effective vocational-industrial and/or technical teacher in the C-JC?

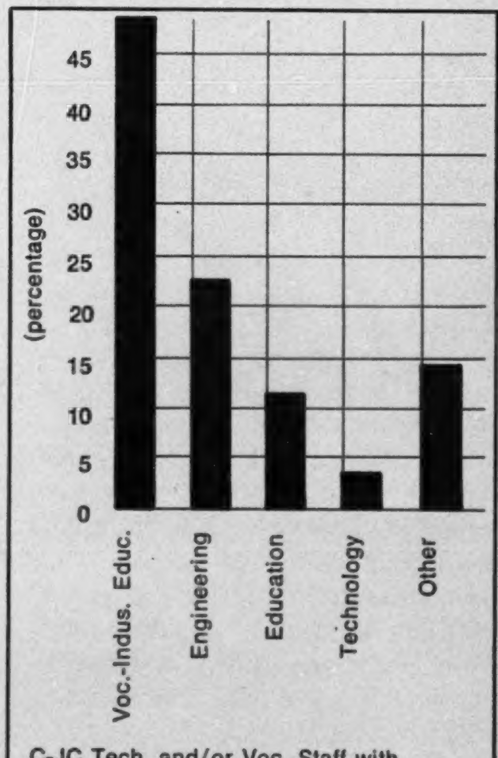
The engineer should have had appropriate work experience with in-service training in teaching methods relating to technical education. He might also be encouraged to enroll in such methodology courses as might be offered at area universities. Ideally, a master's degree in engineering or technology should be planned to meet his specific needs. It should be recognized that the professional engineer will probably require training in preparing courses of study and in methodology and theory. He should be assisted with this if he is to become an effective teacher.

What would be an appropriate M.S. program for vocational-industrial and/or technical teachers?

Many universities offer course work leading to a master's degree in technology. The following program is typical of those which would provide quality education at this level:

1. Possess a baccalaureate degree with a major in a technical or related field.
2. Show evidence of a mathematics and science background consisting of a minimum of two semesters of college mathematics (eight hours) and a minimum of one year of college physics, and/or chemistry (eight hours).
3. Complete a minimum of thirty semester hours of graduate work.
4. Complete, with the approval of his adviser, (a) twelve to fifteen hours in a major field of study representing his specialty in either industrial technology, industrial supervision, electrical engineering technology, or mechanical engineering and (b) five to eight hours in a related technical or engineering field.
5. Show evidence of work experience in his major field of pursuit. Those who do not have this experience would be expected to spend a minimum of one semester (two to three hours of credit) of supervised internship in industry involving his field of specialty.

It is strongly recommended that the master's degree in technology or engineering technology, rather than in teaching, become the standard graduate degree for C-JC vocational-industrial and/or technical faculty.



C-JC Tech. and/or Voc. Staff with Master's Degree

The master's degree chart indicates that most C-JC vocational-industrial and/or technical faculty hold their degree in vocational-industrial education. It has been recommended that the M.S. in technology be the standard degree and that persons with other M.S. degrees work toward one in technology or arrange other suitable programs of technical subject upgrading.

Industrial work experience of C-JC vocational-industrial and/or technical staff. Median is 10.8 years.

According to survey results, 76.8 percent of C-JC vocational-industrial and/or technical faculty possess other teaching qualifications, such as voc. cert., reg. engr., reg. arch., etc.

What should be the characteristics and abilities of the dean of technical studies?

The dean should be competent in all phases of the programs offered, able to plan and equip the facilities, capable of developing and initiating the details of curriculum, able to provide the necessary leadership in student selection and placement, and be qualified to develop the coordinative departmental teaching efforts which will develop completeness and excellence in the program. This is a difficult position to fill, particularly when the C-JC offer programs in all three areas; namely, vocational, industrial technology, and engineering technology. Deans with a background of engineering tend to emphasize engineering technology and often set standards that are too high for the level of students entering the C-JC. Deans with a background of industrial or vocational education often over-emphasize skill development courses in vocational education and industrial technology. The good dean of technical studies (dean of occupational education and dean of applied arts) has a background in IE and engineering, a master's degree in technology, and a specialist's or doctoral degree in educational leadership plus other qualifications demanded of a high quality vocational-industrial and/or technical teacher.

What effect does the background of the dean of technical studies and the staff of the C-JC have on a pre-industrial teacher curriculum?

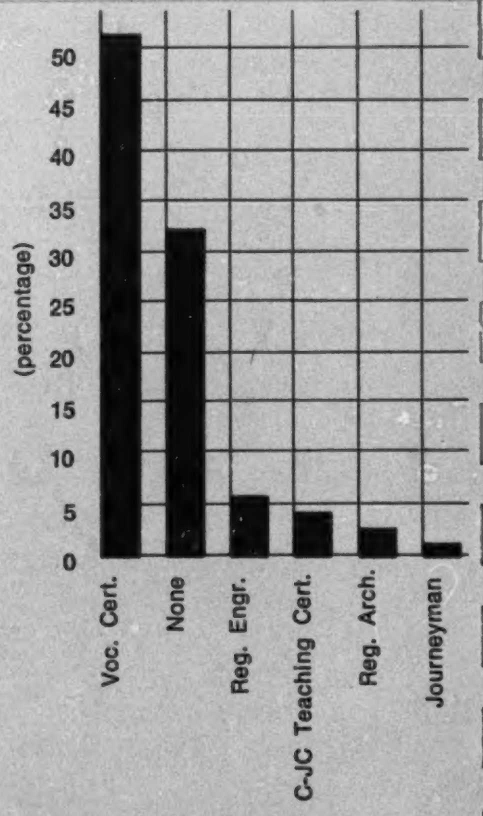
In C-JC where deans have a background in IE and at least half of the staff have similar undergraduate degrees, the problems of offering a pre-industrial teacher curriculum would not be difficult. Good horizontal articulation between C-JC and SI can be accomplished when staff of both institutions have similar background and experience.

What should the industrial work experience requirement be for vocational-industrial and/or technical teachers?

Prior to entering the teaching profession in a specific technology, the instructor should have had appropriate work experience as a technician or professional in his teaching field. In addition to this, he should be required to maintain his competency by regular summer work programs as well as consulting activities during the academic year. Such programs directed toward the maintenance of work experience should be carefully planned by the technical or vocational dean and the individual faculty members.

What types of continuing education activity should be required of the vocational-industrial and/or technical teacher?

In addition to the maintenance of his industrial work experience, the teacher should be encouraged to participate in such activities as summer institutes which are focused on the updating of subject matter in his field of specialization. Faculty should be required, or at least encouraged, to qualify for special licenses or registrations in their professional areas. Meaningful in-service education seminars and short courses should be planned by the dean.



Special Qualifications of C-JC Tech. and/or Voc. Staff

Is there a need for IE teacher aining programs to be expanded include the preparation of technical teachers?

ne existing programs are designed primarily for training high quality industrial arts and vocational-dustrial teachers. The staff and facilities requisite to the preparation of technical teachers is somewhat fferent, and the two kinds of programs are obviously not parallel. Careful consideration should be ven to expanding the curriculum, adding qualified staff, and additional facilities. The decision to do so ould be made in consultation with the appropriate accreditation bodies.

there a need for pre-service training for such professionals as gineers, retired military personnel, chitects, etc., who are hired to teach in the technical or vocational-dustrial programs?

Faculty members who have not had previous teaching experience but possess subject matter competency in their specialty should be required to have pre-service courses. ese courses should deal with the various teaching problems relating to the classroom including the orientation of the instructor with respect to the role of technical or vocational-industrial education in America. Teaching methods, curriculums, course planning, and evaluation are all topics of which the technical or vocational-industrial teacher requires knowledge. One cannot assume that the professional is automatically a qualified teacher.

What is the relationship between industrial technology programs at the SI and C-JC as they relate to preparing teachers of IE?

Certain SI have added four-year programs of industrial technology taught in the same facilities as those used for teacher preparation. Most of these programs are administered by IE departments with a smaller portion in engineering or specialized departments. Often, the courses and teachers are the same in both programs. Industrial technology programs in SI have reduced the potential supply of IE teachers by offering students what appear to be attractive careers in industry. Graduates in industrial technology at the SI could, with additional courses in educational technology, be prepared as industrial technology teachers in the C-JC.

What are the differences in physical plants in the C-JC and SI in IE?

The physical plant in the C-JC should be designed for preparing technicians and qualified vocational personnel. However, these facilities can also serve for a pre-industrial teacher curriculum. There is little difference in the physical facilities for vocational-technical preparation in the C-JC and teacher preparation in the SI in the areas of drafting, electronics and, when offered, graphic arts and power-auto. In the field of metals and materials, the C-JC requires more testing equipment and limited equipment for machining metals. Few programs contain facilities for sheet metal, foundry, forging, or welding unless the emphasis is on vocational-industrial programs. In the area of woodworking, the C-JC normally has little or no equipment or labs unless a vocational program in carpentry and cabinetmaking is offered. In contrast, SI often have their more extensive facilities in this area. Very few facilities in such areas as plastics and ceramics are found in either type of institution.

Whose facilities can be used for a cooperative pre-industrial teacher curriculum?

When a SI develops a cooperative IE teacher curriculum with the C-JC, a survey should be made of the physical facilities in the entire geographic area including SI, C-JC, area vocational schools, and the best senior high schools. Frequently, this survey will reveal strengths and weaknesses in physical laboratories in each institution. By utilizing the best labs in each of these schools for teaching specific vocational-industrial or technical courses, an excellent cooperative program of teacher preparation in IE can be developed. The major problems are cooperation in sharing of facilities and staff, and exchange of programs.

Should there be a sharing of facilities between the C-JC and the SI in close proximity to each other?

In the case of the SI that is preparing teachers and whose students begin there as freshmen, it is highly desirable to avoid spending money to duplicate facilities that may be available in a nearby C-JC. The SI should explore the possibilities of scheduling the laboratory classes in the C-JC facilities. The use of faculty is left to the specific schools. Faculty having joint appointments is one solution. The faculty from the SI can also teach the laboratory courses in the C-JC.

In the case of the C-JC offering programs requiring laboratory facilities that are available in the SI, arrangements might be made to share these, thereby avoiding duplication.

Any such sharing arrangements will require careful planning and close supervision. Great benefits can derive from such cooperative plans, not the least of which is an improved course offering.

Can an SI without technical laboratories carry on an effective teacher preparation program in IE?

It is imperative that SI facilities be carefully planned to meet specific program needs. In some cases, SI may have no laboratories and must arrange for all technical skill courses to be taken in the C-JC, an appropriate high school, or an area vocational school. While this may not be the best procedure, necessity may dictate such action. New programs of industrial teacher education are needed, particularly in certain areas of the country. The SI in that area should give leadership to establish a cooperative teacher preparation program in IE even though physical facilities are not available there.

What factors must be considered to insure harmonious relationships between the C-JC and SI who share technical facilities?

An understanding between the governing bodies of each institution as to expenses/
Careful planning in the scheduling of classes/
Appropriate sharing of the costs for the use of expendable supplies and breakage/
A clear understanding of authority in laboratory supervision/

guidance & counseling

Counseling becomes effective only to the degree that qualified and concerned counselors are in possession of pertinent data and can use this data in aiding students to make meaningful decisions regarding their education. It is the responsibility of both C-JC counselors and the SI personnel to provide accurate information relative to IE teacher curricula.

What special qualifications should counselors possess in order to quide students properly into teacher preparation in IE?

In addition to a graduate degree in guidance, the counselor should, ideally, have had work experience in industry. He can be effective only if he is provided with adequate information regarding IE needs and requirements and if he works closely with the student in developing his educational program. Of paramount importance is the need to establish a reputation for meaningful guidance so that students know where to turn for assistance.

What should be the role of the C-JC counselor in planning and developing a pre-industrial teacher curriculum?

The counselor should be a participant in the development of such a program so that he can gain a better understanding of its intent and purpose. His experiences can be invaluable in pointing out some of the problems of coordination and of identifying students for this program.

Survey results indicate that only 62% of the counselors participate in regular liaison programs.

> ". . . . . . guidance information from universities is too bulky and evasive. A condensed version is needed."
>
> —Florida
> C-JC Counselor

50 *What is the role of the C-JC counselor in keeping the channels of communication open between his college and the IE department in the SI?*

Industrial educators must recognize that the counselor works with a wide range of students, programs, and SI. He must, therefore, be considered a recipient and user rather than an initiator of information. Industrial educators must take the initiative in articulation and provide needed information in a clear and concise format. Additionally, these departments should establish regular communications with counselors. Counselors, in turn, should cooperate in every way to foster and utilize these articulation efforts and suggest possible change or inclusions.

What kind of information is needed by C-JC counselors relative to the teacher preparation in IE?

Effective counseling is often seriously impaired due to lack of specific information. Systematic procedures need to be established in which IE departments would provide counselors with information such as the following:

Clear definitions of industrial arts, vocational-industrial, and technical education programs/

Job opportunities in industrial teaching indicating critical shortage areas and salaries/

Current curriculum data including specific programs, certification requirements, and proposed changes/

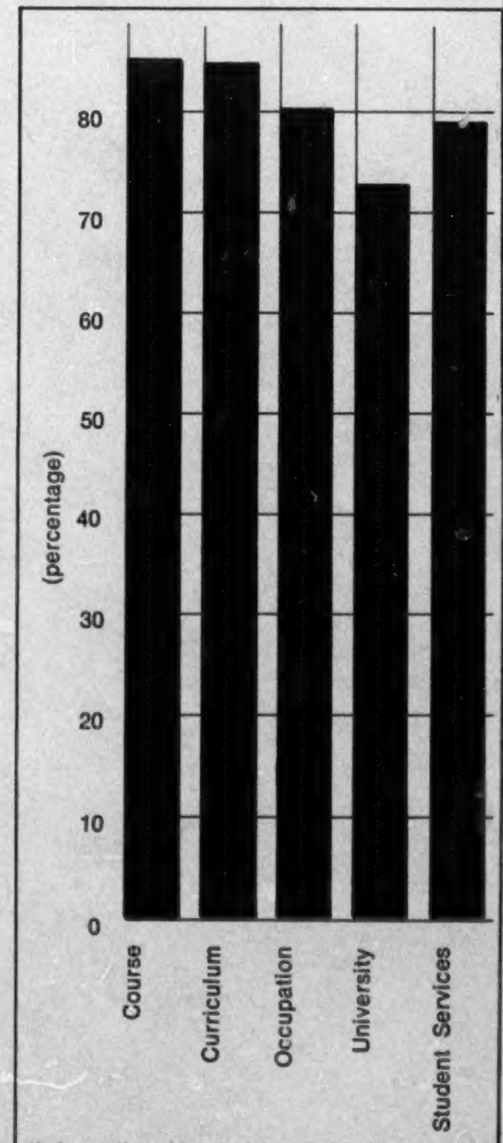
Course equivalencies indicating which courses are acceptable at the SI to satisfy specific curricular requirements/

Admissions requirements including the acceptability of transfer credits and grades/

Characteristics of the SI indicating significant programs and auxiliary offerings/

Transfer student performance data relative to grade reports, honors earned, transfers from programs, and results of follow-up studies/

The scope and availability of student services at the SI in terms of scholarships, student loans, and special guidance facilities/



Information Needed by C-JC Counselors

The following selected samples of curriculum data are important for comparative analysis. Students can be made aware of the areas of specialization, e.g., wood, metal, plastics, etc., offered in each school in addition to special requirements and unique programs. It is important to emphasize the need for current data.

It will be noted that some of the enclosed catalog tear sheets provide more information than others, and some are also easier to use. Imagine the plight of the counselor who has to decipher a disorganized and confusing listing. SI personnel should reconsider layout and content of catalog descriptions so they are effective and convenient to use.

Typical Curriculum — California
Typical Curriculum — New York

Sample Distribution of Courses by Semester (IA)

FRESHMAN YEAR

Basic IA Lab	4	Basic IA Lab	4
Math 11 (or 61)	3	IA Lab 1	2
Physics 1	3	IA Lab 10	2
Psychology 1	3	IA Education 1	3
Economics 1	3	English 1	3
Physical Education	½	Chemistry 1	3
	16½	Physical Education	½
			17½

SOPHOMORE YEAR

Basic IA Lab	4	Basic IA Lab	4
Basic IA Lab	4	Basic IA Lab	4
Math 12 (or 62)	3	Science 6	3
IA Lab 2	2	IA Lab 11	2
Arts and Science Elective	3	Public Address 10	3
Physical Education	½	Physical Education	½
	16½		16½

JUNIOR YEAR

Basic IA Lab	4	IA Education 110—Student Teaching	15
Advanced Lab (Area 1)	2		
IA Lab 3	2		
IA Education 106	4		
Arts and Science Elective	3		
	15		15

SENIOR YE

Advanced Lab (Area 1)	2
Advanced Lab (Area 2)	2
History 21	
Educational Psychology 131	
IA Ed 114	
Art 1	

. INDU... ...CHING

		Sophomore	*Units*
	3	Phys. 2A or Chem. 1A	4-5
& Pract.	2	Psych. 1A—Gen. Psych.	3
Math. 3—Inter. Algebra	3	Math. 4—Trigonometry	3
Philo. or Art	3	Hist. 50—U.S. History	3
Lit. Elective	3	Sci. Elective (Phys. 2B required Electronics specialization)	5
Soc. Sci. Elective	6	Eng. Elective	3
I.A. 3—Ind. Educ. Orientation	1	Pol. Sci. 55—Am. Govt.	3
I.A. Elective	7	I.A. Elective	7
	31		31-32

Junior	*Units*	*Senior*	*Units*
Minor Elective	11	Ed. 100—Soc. Found. Educ.	4
I.A. 295—Ind. Educ.	2	Psy. 100—Psych. Found. Educ.	4
I.A. Elective (See areas of technical specialization)	18	I.A. 110—Methods: Ind. Arts	2
		I.A. Elective	11
		Minor Elective	10
	31		31

52 Typical Curriculum — Illinois

Requirements for the Secondary Teaching Major in Industrial Education—Shop Sequence

Completion of the industrial education curriculum (shop sequence). (See page 101). Completion of nine required courses in Industrial Education: I.E. 155, 157, 205, 214, 260, 265, 270, 275, and 295; two required courses in Industrial Arts: I.A. 270 and 272; and Ed. 232, 233, 234, and 296 I.E. Completion of a nine hour sequence in one of the common shop subjects.

FIRST TRIMESTER	16 HOURS
Bl. Sci. 109, Biological Science I	4
Eng. 126, Intro. to Literature	3
Hist. 107, Western Civilization, 1789—	4
Ind. Ed. 205, General Drafting	3
Psych. 115, Problems of Personal Adj.	0
Physical Education Activity[1]	1
P. E. 206, First Aid and Safety	1

SECOND TRIMESTER	16 HOURS
Bl. Sci. 110, Biological Science II	4
Econ, 151, Prin. of Economics or Geog. 104, World Regional Geography	3
Eng. 127, Composition I	3
Ind. Ed. 270, Print Shop	3
Math. 151, College Algebra	3

THIRD TRIMESTER	16 HOURS
Eng. 224, Readings in English Lit. or Eng. 216, American Literature	3
Ind. Ed. 260, Electric Shop	3
Ind. Ed. 265, Metal Shop	3
Math. 152, Trigonometry	3
Psych. 110, General Psychology	3
Physical Education Activity[1]	1

FOURTH TRIMESTER	1
Eng. 12	
Chem	
Ind.	
Ind. Ed.	
Ind. Ed.	

, 201, 202,
, 321, 322, 412, and 41
logy 202, 317*; Educational
n 420. Industrial Arts 330,

FIFTH TRIMESTER	16
Advanced Shop Courses[2]	
Ind	

RSES FOR UNDER NTS

Typical Curriculum —Florida

IAS 100. Introduction to Industrial Arts Education (2).
IAS 101. Introduction to Handcra t Materials and Processes (3).
IAS 102. Introduction to Industria Crafts and Materials (3). Prerequisite: Industrial Arts Edu ation 101.
IAS 103. An Introduction to the American Industries (3). Prerequisite: Industrial Arts Education 102.
IAS 201. Woods Technology I (3).
IAS 202. Woods Technology II (3). Prerequisite: Industrial Arts Education 201.
IAS 203. Woods Technology III (3). Prerequisite: Industrial Arts Education 202.
IAS 211. Beginning Drawing (3).
IAS 212. Technical Drawing for Industrial Arts Teachers (3). Prerequisite: Industrial Arts Education 211 or equivalent.
IAS 213. Architectural Drawing (3). Prerequisite: Industrial Arts Education 212 or equivalent.
IAS 301. Power Technology I (3).
IAS 302. Power Technology II (3). Prerequisite: Industrial Arts Education 301.

Typical Curriculum — Texas

Vocational Industrial Teacher Education Option

This program is designed for teachers, supervisors, directors, and consultants of vocational educational schools and classes of Texas. Students satisfying the requirements under this program may qualify as teachers under the State Plan for Vocational Education as specified by the Texas Education Agency.

The applicant for this program must have had at least five full years of skilled trade or industrial technical work experience with at least one year of continuous employment. The student who desires to graduate under this program must submit a written request accompanied by a statement of his employed practical experience. Upon the approval of the request by the Head of the Department and the Dean of Engineering, the student will be permitted to plan a program within the limit of the courses listed here.

Approved industrial experience may be evaluated in terms of academic credits and, if acceptable to the Head of the Department and to the Dean of the College of Engineering, may be used in the place of shop work on the basis of four credit hours for each year of industrial experience up to a maximum of 20 credits. Approved teaching experience may be credited as supervised teaching on the basis of two credit hours per year up to a maximum of six credits.

Graduates of this program will receive the Bachelor of Science degree in Industrial Education and may qualify for the appropriate teaching certificate as approved by the Texas Education Agency.

REQUIRED COURSES

GENERAL EDUCATION		Minimum Credit
Economics		3
Econ. 203 Principles of Economics	3	
English		12
Engl. 103 Composition & Rhetoric	3	
Engl. 104 Composition & Rhetoric	3	
Engl. 203 Introduction to Literature	3	
Engl. 210 Argumentation	3	
History		
Hist. 105 History of United States	3	
Hist. 106 History of United States	3	
Mathematics		
Math. 102 Algebra		
Math. 103 Plane Trigonometry		
Political Science		
Pol.S. 206 American National Government		
Pol.S. 207 State and Local Government		

TECHNICAL

Engineering Drawing
E.G. 105 Engineering Graphics
E.G. 106 Descriptive Geometry
Engineering Problems
M.E. 101 Engineering Problems
Shop Work
Includes credit for industrial work experience
Industrial Supervision or Management
[illegible] vision

Typical Curriculum — Michigan

30 Hours

21 hrs.

2 hrs.

…op. Ed.

2 hrs.

d. Teaching of Ind. [illegible] 3 hrs.

e. Vocational-Technical Ed. 200 2 hrs.

7. Teaching Education Option III (Without Teaching Certificate) 30 Hours
   a. Vocational-Technical Ed. 200 2 hrs.
   b. Psychology 3 hrs.
   c. Technical Ed. Methods 340 3 hrs.
   d. Conference Leadership 406 3 hrs.
   e. Industrial Sociology 575 3 hrs.
   f. Electives 16 hrs.
8. Physical Education or R.O.T.C. 4 Hours

C. Degree

Major consists of one or two options:
Vocational Industrial Education (Certificate)
Technical Education (Non-Certificate)

With the following information on degrees available in the SI, the counselor can be apprised of the availability of graduate and undergraduate programs in his geographical area; this may be especially important for students desirous of continuing toward graduate degree work. Some indication of the curricular offerings will also be of great benefit, e.g., industrial arts, vocational-industrial, and technical education programs.

	B.S. B.A.	M.S. M.A.	Spec.	Ed.D. Ph.D.	Indus. Arts	Voc. Educ.	Tech. Educ.
CALIFORNIA							
California State Col. Long Beach	■	■			■		
California State Col. Los Angeles	■	■			■	■	
California State Polytechnic Col.	■				■		
Chico State Col.	■	■			■		
Fresno State Col.	■	■			■	■	
Humboldt State Col.	■				■		
Pacific Union Col.*	■	■			■		
San Diego State Col.	■	■			■		
San Francisco State Col.	■	■			■	■	
San Jose State Col.	■	■			■	■	
Univ. of California, Los Angeles				■	■	■	■
FLORIDA							
Florida A & M Univ.	■	■			■	■	
Florida State Univ.	■	■		■	■	■	
Univ. of Florida	■	■	■	■			■
Univ. of West Florida	■				■	■	■
Univ. of Miami	■				■	■	
Univ. of Tampa	■				■		
ILLINOIS							
Bradley Univ.*	■	■			■		
Chicago State Col.	■	■			■		
Eastern Illinois Univ.	■	■			■		
Illinois State Univ.	■	■			■		
Northern Illinois Univ.	■	■	■		■	■	■
Southern Illinois Univ.	■	■		■	■		
Univ. of Illinois	■	■	■	■	■	■	■
Western Illinois Univ.	■	■			■		

*Private Institution

Tech. Educ.	Voc. Educ.	Indus. Arts	Ed.D. Ph.D.	Spec.	M.S. M.A.	B.S. B.A.	
							MICHIGAN
		■			■	■	Central Michigan Univ.
		■		■	■	■	Eastern Michigan Univ.
■	■	■				■	Ferris State Col.
		■	■		■	■	Michigan State Univ.
	■	■			■	■	Northern Michigan Univ.
■	■		■	■	■		Univ. of Michigan
		■	■	■	■	■	Wayne State Univ.
	■	■			■	■	Western Michigan Univ.
							NEW YORK
		■			■	■	City Col. of the City Univ. of N Y
		■	■		■		Columbia Univ.
	■	■	■		■	■	New York Univ.
■	■	■			■	■	State Univ. Col. at Buffalo
■	■	■			■	■	State Univ. Col. at Oswego
							TEXAS
		■			■	■	East Texas State Univ.
		■	■		■	■	North Texas State Univ.
		■			■	■	Prairie View A & M Col.
		■			■	■	Sam Houston State Col.
		■			■	■	Southwest Texas State Col.
		■				■	*Southwestern Union Col.
		■				■	Sul Ross State Col.
		■				■	Texas A & I Univ.
	■	■	■		■	■	Texas A & M Univ.
		■				■	Texas Southern Univ.
		■				■	Univ. of Houston
		■				■	West Texas State Univ.

student transfers and admissions

All of the issues presented in this bulletin are ultimately directed toward providing the student with a more effective transition from C-JC to SI. The transfer student is burdened with poor counseling, misunderstandings, and the lack of clearly defined programs leading to careers in industrial teaching. In many C-JC such problems do exist; in this section, several of the most significant are presented and guidelines to action are offered.

What is the typical C-JC student like who transfers to an industrial teaching program at an SI?

The student attended a general high school where he took at least one industrial arts course and was enrolled in a college preparatory curriculum. His father was employed in a professional, technical, or managerial occupation. The student has been influenced by a variety of factors which have had a bearing upon his decision to enter the field of industrial teaching. This is significant for it points out that factors aside from professional counseling frequently influence career choice. This would indicate that a multiple approach must be employed to assist in career decisions.

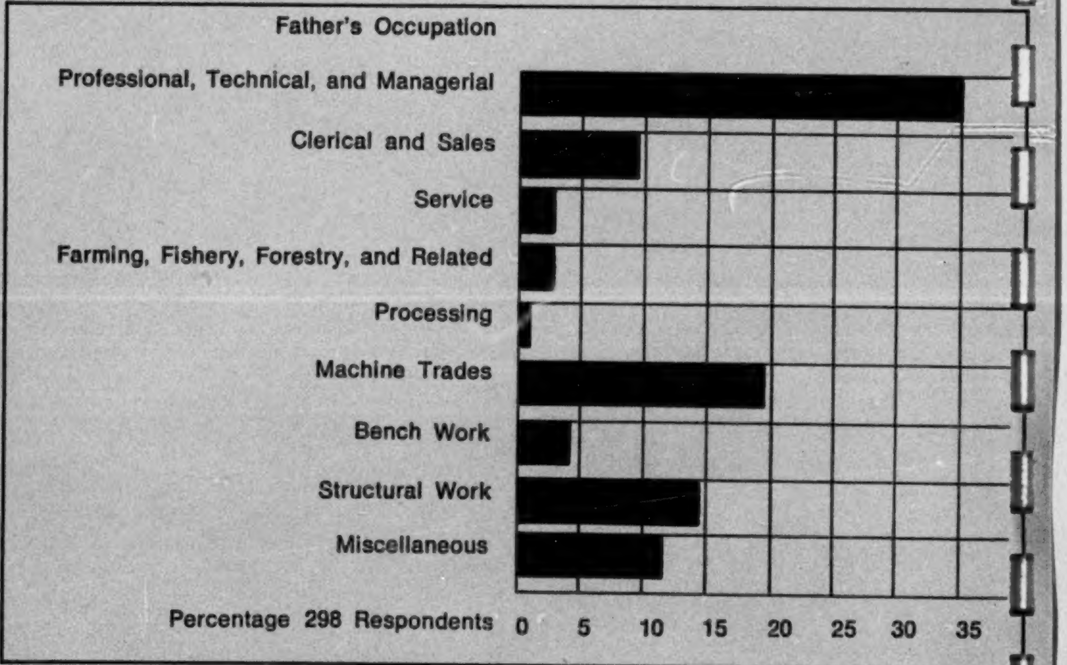
Type of High School	429 Respondents
General	398
Vocational	20
Technical	11

High School Attendance

Factors Influencing Choice of Industrial Teaching Career

Person or Factor	Very Important	Somewhat Important	Slightly Important	Not Important
	433 Respondents			
High school counselor	8	32	37	307
High school teacher	77	88	65	185
C-JC counselors	38	49	46	264
C-JC teacher	92	73	42	182
Parents	47	91	72	155
Friends	53	87	92	160
Reading	61	121	75	125
Work Experience	175	105	44	66

Parental Occupation Data (Occupations defined by the "Dictionary of Occupational Titles, 1965.")



High School Curriculum

Type of Curriculum	437 Respondents
College Preparatory	238
General	155
Vocational or Technical	44

> "We need more counselors that care more about *individual* students. At . . . . . . College, they have particularly poor counselors."
> —California
> C-JC Student

How do C-JC students evaluate the effectiveness of counseling leading to their selection of an industrial teaching career?

According to the chart, counselors have not been significantly influential in guiding C-JC students to industrial teaching. Notable, however, is the number of students who indicate that the SI counseling staff was of the greatest assistance to them. This is due, no doubt, to a better grasp of the situation, in that the SI is obviously more conversant with policies relative to their own program.

	433 Respondents		
Counselor Effectiveness Data	High School	C-JC	SI
Counselor understood industrial field and was able to give good advice.	49	135	201
Counselor took a personal interest in me.	85	133	154
Counselor understood my interests and abilities.	86	139	122
Counselor understood offerings of C-JC and SI and was able to help in setting up my program.	43	131	158

When do C-JC students make the decision regarding their selection of industrial teaching as a career?

The information contained in the chart indicates that career decisions are made in the C-JC. It follows, therefore, that the C-JC must strive to improve the quality and accuracy of counseling data in close cooperation with the SI.

When IE Career Decision is Made	429 Respondents
C-JC	112
Between C-JC and SI	95
SI	77
High school	73
Between high school and C-JC	56
Junior high school	16

> "Something must be done about the
> loss of credits. Too many hours
> are lost when transferring . . . . . .
> it is very discouraging . . . . . ."
> —Illinois
> C-JC Student

What kinds of problems do C-JC students face in transferring to SI?

Problem	433 Respondents
Loss of transfer credit	290
Financial	268
Having to take additional basic courses	185
Differences in teaching methods	77
Need to repeat courses for grade below "C"	65
Courses more difficult at SI	56
Not knowing how to study for SI courses	43

As evidenced in the chart, the most pressing problem faced by the C-JC student is the loss of credits when transferring to the SI. This is not an unsolvable issue. Proper counseling, an articulated transfer scheme, or an innovative pre-industrial teacher curriculum can contribute much toward overcoming this student problem. Several other aspects of this same problem are treated on the following pages.

Who should evaluate transfer credits —admissions office or IE departmental personnel?

An agreement should be made in each SI between the admissions office and the IE department regarding the acceptability of C-JC credits. The admissions office should then evaluate the credits of transfer students in accordance with this agreement and refer to the IE department those cases which require special attention. The C-JC counselors should be informed of such administrative decisions.

By what means should the quality of transfer credits be evaluated?
Industrial education faculty members from the SI should visit the C-JC regularly and become well acquainted with the vocational-industrial and technical programs including courses, instructors, methods of teaching, and facilities.

Senior institutions should, on a regular basis, provide C-JC with meaningful information concerning the over-all progress of transfer students and their degree of success in specific courses at the SI.

In the case of an applicant whose credits are not covered by [illegible] agreement, the acceptability of his credits should be determined through a student interview or a proficiency examination. Only as a last resort should temporary credi be assigned, subject to validation by performance at the SI.

> "There is a basic problem of communication between the C-JC and SI."
>
> —Texas
> C-JC Student

To what extent should the student's credits and grade point average earned at the C-JC be transferred to the SI?

Instead of limiting the student to a maximum number of credits that can be transferred, the SI should accept all credits earned at the C-JC and simply require that a minimum of one-half of all credits required for the baccalaureate degree be completed at the SI. Under this plan, the student is less likely to feel that he has lost credits in the transfer process.

If a C-JC graduate is certified by that college as having met all of its lower division general education requirements, he should be given full upper-division standing by the SI. He should not be evaluated on a course-by-course basis to determine whether he has satisfied the SI specific lower division general studies requirements.

The grade point average earned at the C-JC by a transfer student admitted to IE should be accepted as if it had been earned at the SI. A "D" grade earned before transfer should be considered in the same light as a "D" earned by an SI student.

What should be the role of testing in evaluating transfer courses and placing students in classes at appropriate levels?

Where unusual circumstances exist, a transfer student admitted to IE in a SI may reasonably be asked to take achievement examinations for the purpose of placing him at the appropriate level in various sequences of courses begun in the C-JC. Such examinations should not be required to validate credit earned in the C-JC courses which both institutions have agreed are parallel or equivalent.

Examination results may also be used as a basis for awarding credit for C-JC courses which might not otherwise transfer or for out-of-school experiences. Examples are: Community-junior college courses which are normally taught at the upper-division level by the SI/ Community-junior college courses usually regarded as terminal or offered in vocational programs/ Academic achievement through out-of-school experience, e.g., job-related training or military service schooling/

How can some of these student criticisms be satisfied?

Most C-JC student objections arise from ineffective counseling and from being uninformed regarding the nature and availability of industrial teaching programs. By establishing a pre-industrial teacher curriculum in the C-JC, by providing transfer student handbooks, by devising improved transfer schemes on the part of the SI, and by planning the counseling effort students will be encouraged to enter industrial teaching programs. These innovations should be given wide publicity.

résumé

This study was made to investigate ays of improving the quality and uantity of IE teachers in California, New York, Texas, Illinois, Michigan, nd Florida. These states were lected because:

They are six of the nine largest in pulation/

ney have about one-third of all the public C-JC in the United States/

he shortage of qualified IE teachers is an especially critical problem since it is estimated that 100,000 w degree teachers of IE will be needed during the next five years in the United States.

he principal thrust of the study was to examine approaches for utilizing aff, facilities, counseling services, nd programs in the C-JC for preparing IE teachers. All catalogs om C-JC and SI were analyzed. urveys were sent to IE department heads, admission offices and ansfer students in IE at the SI; nd to counselors and deans of technical studies at the C-JC. The sults revealed the following about:

Curriculum—Many vocational-industrial and technical courses fered in the C-JC have the same kind of content as those offered in SI for IE. There are, however, very w pre-industrial education curriculums presently offered in C-JC.

Articulation—A need exists for improving the articulation between the courses and programs in the C-JC and the SI for preparing IE teachers.

Staff and Facilities—About half of the vocational-industrial and/or technical staff in the C-JC hold B.S. degrees in industrial or vocational education.
Facilities are available in most C-JC for offering many courses—principally in metalworking, drafting, and electronics.

Counselors—Counselors need better and more information concerning such matters as definitions of IE, job offerings, current curriculum data, course equivalency, admission requirements, schools at which IE is available, and transfer student performance data.

Students—Seventy (70) percent of the students majoring in IE are transfers from C-JC. About 50 percent made this career decision during or after their C-JC experience. The most pressing problem students face is the loss of credits when transferring to the SI.

Based on the information:
A Work-Study Conference of representatives from the six states developed this bulletin. These leaders recommended two innovative approaches for preparing IE teachers in the years ahead. They are identified as the PAP (Partnership and Pyramid Programs).

The *Partnership Program,* (two and two) is a planned curriculum developed cooperatively by the C-JC and the SI with a structured pre-industrial teacher program at the C-JC. It is designed as another career opportunity for students wishing to take vocational-industrial and technical classes. This two-year curriculum should be accepted at the SI as the first two years of a degree program in IE. It is designed for students who decide to become IE teachers before entering C-JC.

The *Pyramid Program* (two plus two) is a plan for building a four-year IE degree on the A.A.S. in Technology. The SI would tailor a program for the technical graduate, building on his technical competencies such additional courses in mathematics, science, education, and general academic as are needed to prepare him for teaching in vocational-industrial or technical education. It is designed for students who decide to become teachers of IE later in their C-JC experience or before they enter the SI.

If quality programs of IE—industrial arts, vocational-industrial, and technical education—are to grow and flourish in the years ahead, these two new teacher education approaches must be implemented in the six states covered by this study and all other states in which the C-JC is becoming a dominant part of the total educational scene.

DEVELOPMENT OF JUNIOR/COMMUNITY COLLEGE
CURRICULA FOR FUTURE TEACHERS OF
INDUSTRIAL EDUCATION

USOE Sponsored Project #7-0074
Grant #OEG-0-8-070074-3713 (085)

Please evaluate the guideline bulletin by checking (✓) this form and returning it to us promptly. Add comments or reactions on the opposite side of this sheet.

☐ Check here if one additional copy of the bulletin is desired from our limited supply.

1. Do you believe that the C-JC should provide technical and professional courses for students planning to complete a degree at an SI?

Yes	No

2. What is your over-all reaction to the bulletin in terms of comprehension, utility, accuracy, and presentation?

Exc.	Fair	Poor

3. How do you evaluate the usefulness of the information and recommendations dealing with:

Exc.	Fair	Poor	SECTION ON:
			Focus on the Problem
			Curriculum
			Articulation
			Staff and Facilities
			Counseling and Guidance
			Student Transfer and Adm.

4. Do the problems outlined in the section "Student Transfer and Admission" reflect those you are currently having with transfer students?

Yes	No

5. Do you presently have or are you planning an arrangement between the C-JC and SI in your geographic area that follows the general guidelines listed under the:

Have Yes	Have No	Planning Yes	Planning No	
				PARTNERSHIP PROGRAM
				PYRAMID PROGRAM

6. Are regular meetings held between personnel of the SI and C-JC in your area to discuss the articulation of programs for preparing IE teachers?

Yes	No

7. If a Partnership Program were established in your area, should there be:

Yes	No	
		New professional courses at the C-JC, such as Introduction to IE
		Seminars for counselors in C-JC and SI
		In-service programs for technical teachers in C-JC and SI

8. What reasons can you give for not putting one of the articulation plans into effect immediately?

Partnership	Pyramid	
		Financial problems
		Political problems
		Lack of cooperation with C-JC
		Lack of cooperation with SI
		Already have successful program

9. Do you believe the implementation of the guideline recommendations will improve the articulation between the C-JC and SI?

Yes	No

10. Will this guideline bulletin affect your future plans for cooperating in IE teacher preparation programs?

Yes	No

Make any corrections in address (add name if omitted) that are necessary to keep our records correct.

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